American Artisan

Founded 1880

The Warm Air Heating and Sheet Metal Journal

Vol. 96, No. 8 CHICAGO, AUGUST 25, 1928 $2.00 Per Year

Naturally We're Proud of Homer Furnaces

In the charts below we take great pleasure in publishing actual University of Illinois measurements as sponsored by the National Warm Air Heating and Ventilating Association. When you sell Homer Furnaces you sell a furnace which is rated by the**University of Illinois** and one that is built according to the Standard Code of Heating.

Heating Surfaces and Grate Areas and Standard Code Ratings

Furnace: HOMER GRAND — Cast Circular Radiator

Size of Fire Pot	No. of Furnace	Heating Surface Sq. In.	Grate Area Sq. In.	Ratio Heating Surface Grate Area	Rating Sq. In.
18″	18-40	4037	198	20.4	350
20″	20-42	4533	254	17.9	426
22″	22-46	5404	310	17.4	514
24″	24-49	6556	376	17.4	624
28″	556-K	8046	457	17.6	762

Remarks: Ratings according to 4th Edition Standard Code. This series made with two types of grates. Heating Surface and grate area same for both types.

Measured by: F. A. S. Check by: J. F. Q. Date: 3-27-28.

Furnace: HOMER ACE — Cast Circular Radiator

Size of Fire Pot	No. of Furnace	Heating Surface Sq. In.	Grate Area Sq. In.	Ratio Heating Surface Grate Area	Rating Sq. In.
18″	19-18K	4045	204	19.8	356
20″	19-20K	4467	251	17.8	420
22″	19-22K	5116	310	16.5	505
24″	19-24K	5731	380	15.1	600

Remarks: Ratings according to 4th Edition Standard Code.

Measured by: F. A. S. Checked by: J. F. Q. Date: 3-29-28.

ROS STRONG, *General Manager Says*

These accompanying charts are the reasons why Homer dealers are so successful in marketing Homer Furnaces. Once Homer furnaces are introduced in a community they sell themselves thru enthusiastic users. A Homer Furnace Agency contract swells the net profits of your business, so investigate at once.

HOMER "GRAND"

These Are the Units

The Homer Grand and the Homer Ace are the units described in the above charts. They not only are serviceable but equally as beautiful because they're designed by master builders according to the Standard Heating Code.

HOMER "ACE"

HOMER FURNACE CO., *Coldwater, Michigan, U. S. A.*

Capacity over 30,000 Furnaces Annually

"What's home without a Homer"

There's Harmony in Homer Heated Homes

How Bill got ALL the big Furnace jobs in Town

Bill Jones was about ready to quit. Nearly every time he bid for a heating contract someone else bid lower. It happened time after time. He got just enough skim milk jobs to kid him along.

But every cent Bill had was in his furnace business, and he was determined to make good. He read his trade publications faithfully. One day he read there about a wonderful new invention that corrected practically every trouble he ever knew a furnace to have. It said that this device enabled any contractor to forget competition and get better contracts than he ever got before.

The Miles Automatic Furnace Fan made it possible to *guarantee* plenty of good warm air heat in every room, on every job. It *pushed* warm air up the pipes in winter and cool air in summer. It cut down fuel costs, gave four healthful changes every hour in every room, and even heat from floor to ceiling. No more cold rooms or cold corners.

Bill saw how this fan gave the furnace contractor something to talk about besides price. It would help him get the big profitable jobs where price was not the only consideration. Moreover, he could sell fan outfits to cure sick old furnaces which had failed to make good. He could make almost as much profit on these fan installations as on a furnace job.

Bill wrote and found that furnace contractors in every state in the Union were installing Miles Automatic Furnace Fans—thousands of them. He found that the Miles Fan was the only one with the automatic *louvers* that change the furnace from a forced air system to a gravity system and back again, instantly, as needed. He ordered a Miles Fan demonstrating unit and got busy.

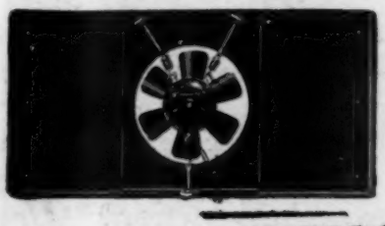
All the contractors in town were hot after the big new Wooley mansion job. It ran into money. It meant a lot in reputation, too, for old Wooley was the biggest man in town. Bill walked off with the job, to the surprise of his stronger competitors. He made it a Forced Air job.

Before the year was over Bill had put Miles Fan equipped furnaces into seventeen more big new houses, the finest residences built in his town that year, and the most profitable contracts. He got these big jobs and more small ones than he ever got before. He became the leading furnace contractor.

This story about Bill is no fable. We can give you the names and addresses of many contractors who have done exactly what he did. We are printing these true stories every month in FAN FACTS, our free magazine which tells the why, how, where, who of Forced Air Heating.

Send us your name and address if you want to be put on our mailing list to get this monthly news and information. Stop trying to beat the other fellow on price. Beat him in service with Miles Automatic Forced Air Heat and Ventilation. Be first in this new field.

THE WARM AIR FURNACE FAN COMPANY
6521 Cedar Avenue ∴ ∴ Cleveland, Ohio



New No. 500
Miles Automatic Furnace Fan
ONLY $50.00

This new low price fan, for buildings up to 12,000 cubics, makes Miles the most complete line of furnace fans. We also announce a larger engineering staff. We are now able to give you quick action on layouts for your Forced Air jobs.

MILES AUTOMATIC FURNACE FAN WITH LOUVERS

WARM AIR FURNACE FAN CO.,
6511 Cedar Avenue, Cleveland, Ohio

☐ Put me on your list to receive FAN FACTS every month, free

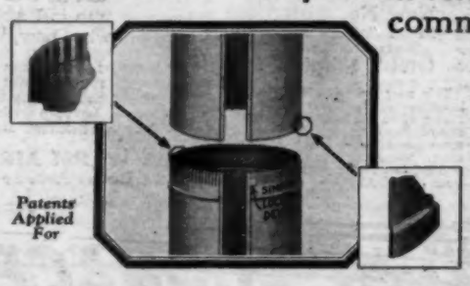
☐ Send me prices and full information about your complete line

Name_____ Address_____ City_____ State_____

Published Weekly by American Artisan and Hardware Record, Inc., 620 South Michigan Avenue, Chicago, Illinois. AMERICAN ARTISAN—the Warm Air Heating and Sheet Metal Journal—entered as second class matter, March 26, 1928, at the Post Office at Chicago, Illinois, under act of March 3, 1879. Formerly entered on June 25, 1887, as American Artisan and Hardware Record.

MOST people's idea of a bargain is a good product at a fair price. Surely, then, a better product at the ***same*** price is doubly a bargain.

Lamneck round tin pipe and fittings were always a bargain—a ***good*** product at a fair price. Now that they have the advantages of the Lamedge joint at no extra cost they are more than ever a bargain. They make all ordinary round tin pipe and fittings costly by comparison — they are so much ***better.*** Better pipe and fittings save your time and your money, and enable you to give your customer quicker service and a more workmanlike job. Such fittings are ***worth*** more to you. Surely ***when improved fittings cost no more*** it is common sense to use them.



Why not prove the convenience and superiority of Lamneck round tin pipe and fittings to your own satisfaction? ***Use them on your next job.***

THE W. E. LAMNECK COMPANY, 416-432 Dublin Avenue, Columbus, Ohio

LAMNECK SIMPLIFIED PIPE AND FITTINGS

Say you saw it in AMERICAN ARTISAN—Thank you!

Nested Cold Air Pipe

COLD AIR *is just as important as* WARM AIR

—A little easier to handle to be sure but it needs good quality pipe and easily adjustable elbows.

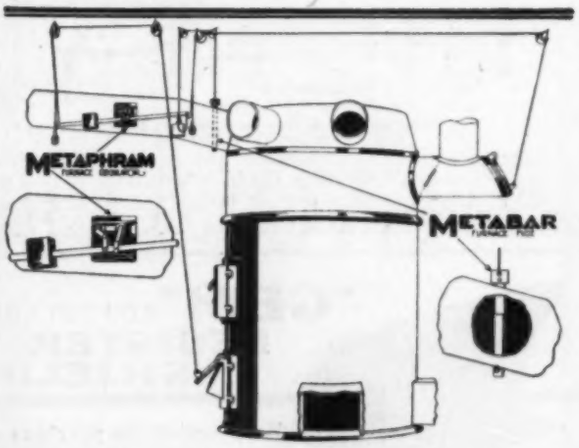
The handiest COLD AIR pipe and elbows come from the home of HANDY PIPE.

Write for catalog No. 45 which tells you more about it.

F. MEYER & BRO. CO.
PEORIA, ILL.

Galvanized Adjustable Elbows

GRADUAL CONTROL
for all return air furnaces



IT is very plain that gradual opening and closing of both draft and check dampers on a warm air furnace will give more uniform temperature in the fire box and more uniform temperature from the heating system.

This gradual operation of draft and check dampers is furnished by

NATIONAL METAPHRAM FURNACE REGULATOR

Metaphram Furnace Regulator is a self-contained, self-operating heat regulator, installed as illustrated in the drawing above.

Needless to say, it has aroused the interest of both furnace manufacturers and dealers.

If you are not familiar with Metaphram Furnace Regulators, clip the coupon or write us today.

National Regulator Co.
2303 Knox Avenue Chicago, Illinois

NATIONAL REGULATOR CO.,
2303 Knox Ave., Chicago.

Please send complete information and dealer proposition on METAPHRAM Furnace Regulator.

Name .....

Address .....

Town and State .....

My jobber is .....

"Works easier and durability superior"

.... that's what this shop thinks of ARMCO Ingot Iron

WE operate an ARMCO Ingot Iron Shop exclusively because we endeavor to give quality work and quality material. ARMCO Ingot Iron works easier than ordinary irons and steels and its durability, and consequent customer satisfaction, is far superior to any sheets we have ever used.

"You will be interested to know that our standing instructions to workmen are to always work the material with the blue ARMCO Triangle on the outside. In this way our customers know that they are receiving genuine rust-resisting ARMCO Ingot Iron.

"Your cooperation in supplying blotters, billheads, letterheads, and other advertising helps is indeed valuable.

"We are positive that with your continued support, our shop, as well as any other Ingot Iron Shop, is certain to get more business with bigger profits."

By M. KRATZERT,
Schlatter & Kratzert
Sheet Metal Works,
Peoria, Illinois

YOUR shop, too, can share in the many advantages that go with an "Ingot Iron Shop" franchise. Your blue and white identification sign attracts prospects. Millions of sheet metal buyers are reading about "quality work with quality iron" in their favorite magazines.

Moreover, your shop overhead is lowered, thus insuring increased profits .... ARMCO Ingot Iron, because of its workability, does cut labor costs—in the shop and on the job. The next time your sheet metal salesman comes around ask him for an application card. Or else write us direct.

ARMCO
INGOT IRON
RESISTS RUST

ARMCO Distributors' Assn. of America

Executive Offices: Middletown, Ohio

Founded 1880

Published to Promote Better Warm Air Heating and Sheet Metal Work

American Artisan

The Warm Air Heating and Sheet Metal Journal

Yearly Subscription Price:
United States.....$2.00
Canada $3.00
Foreign $4.00

Published EVERY SATURDAY at 620 South Michigan Avenue, Chicago

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Eastern Representatives: M. M. Dwinell, J. S. Lovingham, 156 Fifth Avenue, New York City

Vol. 96, No. 8 — CHICAGO, AUGUST 25, 1928 — $2.00 Per Year

Table of Contents

AN APPRECIATION

A letter from George Crouch and Sons, Warm Air Heating Specialists of Chattanooga, Tennessee, certainly tickles our pride in the work we are doing.

"Please find enclosed two years renewal. We just simply can't do without your good magazine. Every issue seems better than the last."

THATCHER METEOR "PIPELESS" FURNACE *Cuts Fuel Cost 30–40%*

THATCHER METEOR "PIPELESS" FURNACE

THE Thatcher Meteor "Pipeless" Furnace provides your customers with ample, healthful heat, at what is probably, the lowest fuel cost for any heating plant. It is said to be the world's finest pipeless furnace, and it cuts fuel cost 30 to 40%.

A particularly desirable feature is the horseshoe type radiator, which provides twice the usual amount of fire travel, and hence, utmost utilization of heat.

Anti-clinker triangular grates are likewise supplied. The ash pit and ash pit bottom are cast in one piece, a decided advantage over the bolted type. Besides providing a substantial base for the furnace, this construction makes The Thatcher Meteor "Pipeless" Furnace entirely dirt proof.

The Thatcher Meteor "Pipeless" Furnace is available in 6 different sizes with capacities for heating up to 35,000 cu. ft., and is a dependable installation for either old homes or new. Write for literature.

Equipment Features:

Horse shoe type radiator
(cast iron or steel)

Anti-clinker triangular grates

One-piece cast iron, dust-proof ash pit

Special Thatcher Register

Two outside clean-out doors

Special Thatcher Water Pan

Upright Shaker Handle

Hot Blast Attachment for soft coal

Two-Piece Fire Pot

Large corrugated combustion chamber

THE THATCHER COMPANY
39-41 St. Francis Street, NEWARK, N. J.
NEW YORK: 21 W. 44th St. CHICAGO: 341 No. Clark St.

THATCHER
BOILERS-FURNACES-RANGES

INSURE
100% Heating Efficiency with these Specialties

THE name "Richardson & Boynton" means as much on the smallest heating accessory as on the biggest battery of heaters. Each specialty is thoroughly tested under operating conditions and is guaranteed by the factory. In using the items shown above the installer insures 100% job and assures the everlasting good-will of his customers.

This company believes in utmost protection to the dealer—the logical link between factory and consumer.

RICHARDSON & BOYNTON CO

Manufacturers of "Richardson" "Perfect" Heating and Cooking Apparatus Since 1837

260 Fifth Avenue New York City

New York Utica Newark Philadelphia Boston Chicago Buffalo Minneapolis Cincinnati Pittsburgh Detroit Providence

American Artisan
The Warm Air Heating and Sheet Metal Journal

Vol. 96 CHICAGO, AUGUST 25, 1928 No. 8

Warren Carter says—

INTENSIVE SALESMANSHIP

Plus BACKBONE

Best Remedy for Excessive Competition Now Existing in SHEET METAL BUSINESS

THE sheet metal contracting profession is today suffering from too much internal competition. If some of the energy that is being used to wrest jobs from competitors in the same line was applied towards the development of more and better sheet metal work, there would be a different and more healthy situation.

We could learn better how to sell the art of sheet metal installation and devote less time to making low prices.

What are we in this line of business for anyway, or any line for that matter?

(1) To make money.
(2) To render service.
(3) To satisfy an ideal.

We are all in business to make money and render service.

Most certainly we are in business to make money, improve our conditions in life, discount our bills, fullfil our obligations and enjoy distinction as successful business men in our several communities.

One's self-respect is enhanced by proper surroundings, good and serviceable equipment, a modern place in which to do business and an up-to-date office where we can receive our patrons, sales-representatives, and all others, when they see fit to call upon us.

Good surroundings and proper equipment are essential to growth.

All of these things represent expansion and growth, yet are as necessary to our success in the business world as the food we eat. On the other hand, none of them can be properly accomplished without the use and extended use of money.

This money must be gained properly and honestly from one's business or profession, but will not be accumulated through price-cutting. The man or concern which indulges in consistent price-cutting rarely gets ahead in the business world.

To make more money out of our business, we must develop the selling end. Price-cutting can largely be eliminated by the fine art of salesmanship applied at the proper time.

Many general contractors take delight in pitting one sheet metal contractor against another, in an effort to secure lower prices.

There is a lot of bluffing done by buyers, including general building contractors, who take great joy in making extra profits off the subcontractors and in the case of the sheet metal man, pitting one against the other to the detriment of the craft.

Why should the mind of the buyer be fixed on *price* rather than service value and utility? He has unconsciously been taught to look for price first. Always — How much—not How good. Buyers are keen at sensing an opportunity for

> ***Price Cutting Does Not Make for Success***
>
> **WARREN CARTER, of Carter, Donlevy & Co., Philadelphia, author of this article points out some old truths which are ever new.**
>
> **It will pay all of us to read his thoughts to learn again how truly simple is the formula for success—provided we are able to use plenty of application which he so aptly terms BACKBONE.**

securing a cut—far keener than many believe.

We are never price-cutters—It is always the other fellow.

Remember, none of us are ever price-cutters. It is always our competitors, or some buyer who told us we were too high. We spend too much thought on fearing our competitors. In making up an estimate, we are so often guided by fear of what our competitor will or will not do. He is sitting in his office no doubt thinking the same thing about us—result—each man cuts his price below the figure he knows he can do the job for and continue his business properly.

Does the owner gain? No. For he gets in the long run what he pays for and very little more. If the sheet metal man or any mechanic gives more than he bargains for and keeps it up, he will be a candidate for the slide.

Sheet metal jobs can be sold on basis of service and utility if proper sales-force is used.

Let us get away from the price idea for a moment and consider that the real sheet metal job could and should be sold on the basis of its worth to render service for the purpose required—not on price alone.

There are lots of jobs where the idea could be sold that the first cost is the only cost and is reasonable—that, as the years toll by and the work holds up and gives service, as you know it will according to your promise, the original outlay will disappear gradually or become negligible.

What owner, for instance, if he knew a good tin roof would last for 25 years more with a little care and attention, would not consider paying more than for some cheap substitute which would be dead and gone before the metal roof really started on its long life of service?

Ability to interpret plans and execute work properly, plus back-bone to ask a fair price, essential.

To accomplish this ideal, we need back-bone, faith in self, ability to demonstrate our work, knowledge as to how to accurately read and interpret plans and specifications, experience in figuring costs of material and installation, and finally, strength of purpose to get a decent profit on each and every piece of work undertaken without fear or favor.

To educate one's patrons to a better job and a consequently higher margin or a living profit, we must first educate ourselves; so this would be our message, that by resolving to bring out profession to a higher plane, we have taken the first step. The others will follow in easy succession.

Let us therefore place quality, service and utility ahead of price, making the price representative of these elements.

Constructing Pattern for 5-Way Sheet Metal Y-Branch

Problem Treated from a Geometrical Point View to Familiarize Student with That Method

By O. W. Kothe, Principal St. Louis Technical Institute

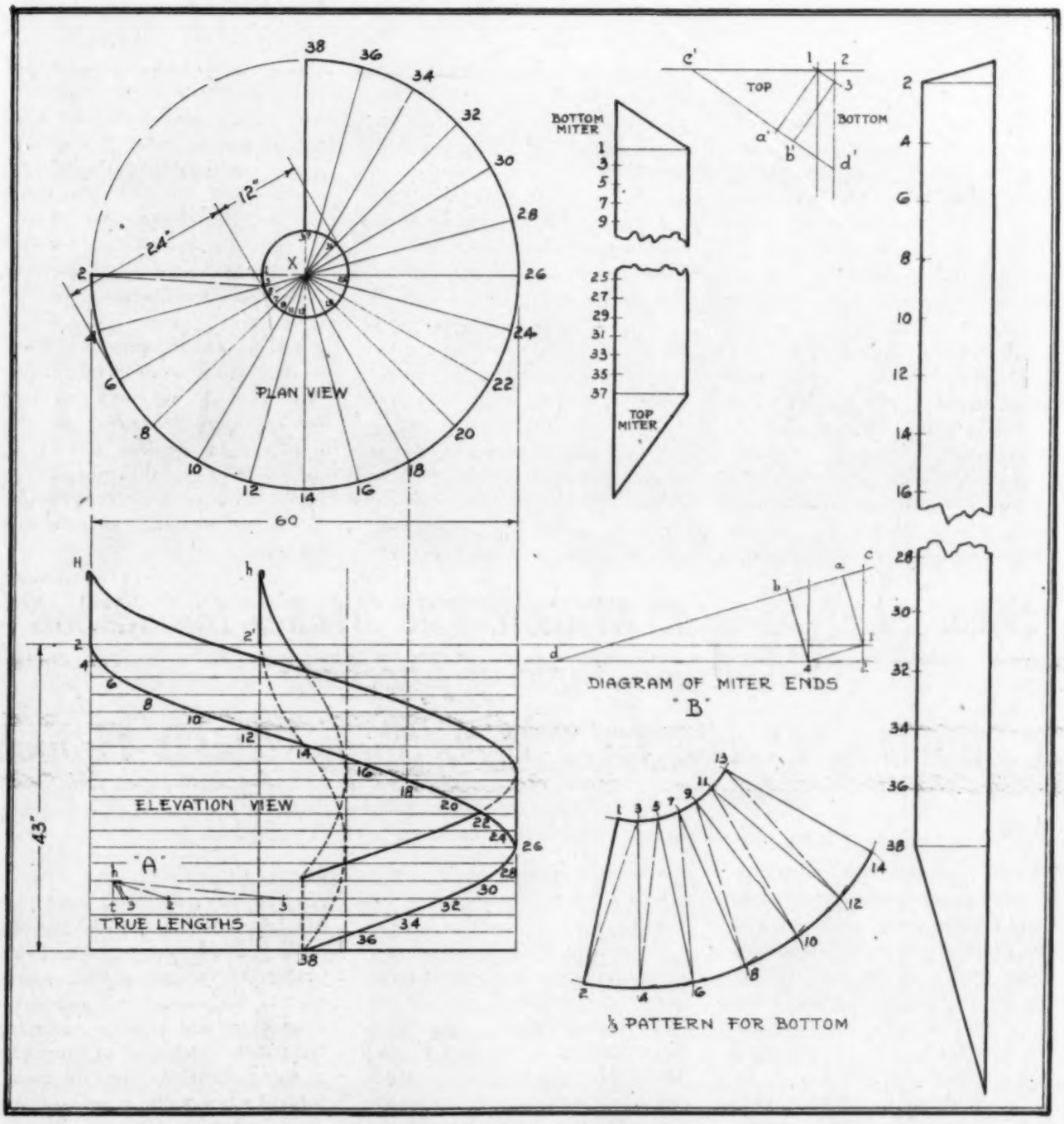
RESPONDING to the inquiry of A. Burt Hart, 824 West 36th Street, Chicago, for a spiral conveyor according to sketch submitted, I give the accompanying drawing for the proper solution. In actual shop work the elevational spiral is not required; since all we need is the rise, or 43 inches divided into as many equal parts, as the plan view contains.

First draw the plan view to full size or half or quarter size scale. In this case a quarter plan is sufficient, since that gives us a correct ratio of the full conveyor. Divide the plan in any number of parts, as from 2 to 14 or 38 in this case. Draw lines to the center, which also subdivides the smaller circle.

Next measure the altitudinal line for the 43-inch drop that the spiral is to make in the three-fourths turn, and divide this into 38 equal spaces. Observe, if we only use a quarter plan, then we must only use a quarter altitude; but in this case we use the full plan and full altitude. In this case the altitude would be divided in three parts, if a third of the three-quarter plan were used as we do.

These altitudinal spaces then give the correct rise between each space of plan. This is shown at "A" where we have the true lengths for the three lines used. Thus, h-t is the altitude of one space, and 2-4, 2-3 and 1-3 of plan are transferred to the base line as, t-3, t-2, t-3′, while the plan line 1-2 retains its width all the way around the conveyor. Then, h-3, h-2, h-3′ are true lengths. The line, 2-3, is for the small girth around the post, while h-2 is for the heel girth, and h-3′ is the dotted cross line 2-3.

To set out the pattern for the bottom of conveyor draw any line, as 1-2, equal to 1-2 of plan; then with dividers pick the true girth, h-3, and h-2 from "A," and with 1 and 2 in pattern as center, strike arcs as at 3 and 4. Then pick true length h-3′ from "A," and using point 2 in pattern as center, cross arcs as at 3. Then pick plan line 1-2, and using the new point 3 as center, cross arcs in point 4. Repeat this operation by striking arcs 5 and 6 equal to the girths h-3 and h-2, and then cross with true length h-3′ and 1-2 of plan, establishing the new points 5-6 in pattern. In this way develop as much of the pattern as you can handle or a third in this case. In order to take the twist out and make the bottom lay level, part of it must be stretched, and another part shrunk or drawn; so it is not well to make these patterns too large. It is always easier



Patterns for Spiral Conveyor

to handle and work the twist out in the rivet lines than trying to force the solid sheet. Of course if the workman has had experience and can handle larger pieces, that is to his benefit.

Now the sides of the conveyor are merely straight strips, with miter lines cut at the top and bottom. This is shown at "B," where 1-2 is the rise of one space of the 43 inches, the space 2-4 is transferred from plan, so that the line 1-4 will be a true length of girth, or is the same as h-2 of "A." Then square out lines as 1-a and 4-b, equal to the width of the wide strips. Then the vertical line 1-c-a will be the top miter line, and by extending the line, c-b to d, then 4-b-d is the proper miter line if the side is to finish on the floor. But if it is to have a vertical cut, then the miter 1-a-c is used.

The proper girth for these strips would be to take 18 spaces times the line 1-4 of "B," or h-2, which gives us the distance 2-38, and beyond this we add the miter cuts as shown. A similar diagram, as at "B," is made for the throat strip; and this is shown as "C," where 1-2 is the rise, and 2-3 is the plan girth 1-3, so that 1-3 becomes the true length, and by adding the width of strip, and drawing miter lines, we can then lay off the pattern as shown. Laps for riveting the edges must be allowed extra.

Residence of H. P. Jordon, Waco, Tex.

Sheet Steel Spanish Mission Tile Makes Inroads on Mansion Type of Dwelling

Imitation Found to Give Better Service Than the Original

By George Duerr

PUBLIC opinion is a strange thing in some respects; it causes many strange things to be done in the manufacturing and merchandising world. In the field of roofing this peculiarity of public opinion is outstanding. Let us direct our attention to what has happened with regard to Spanish tile.

For a period of perhaps forty years or more the tiles—German, French and Spanish—have been before the public, brought out in this country originally by the Ludowici-Celadon Company. But perhaps even before the early activities of Ludowici the Spanish tiles, with which we are particularly concerned in this article, had made their appearance in lower California and Mexico.

This tile roofing was found to lend itself so well to the purpose of covering and at the same time gave the dwelling an attraction that took the public eye, that it was seized upon almost immediately by architects in all parts of the country for roofing.

There were found, however, certain objections to this type of roof; namely, the weight of the tile and its extreme brittleness. To support the weight of a tile roof of any considerable size requires a considerable reinforcement of the understructure; that is, to support the added weight of the tile roof the foundation and frame of the dwelling is required to be materially increased. Then there is the cementing requirement. The clay tile as they are laid are cemented together. Clay tile is subject to expansion and contraction, and the cemented joints are only water tight as long as the cement remains intact. With the movement of the tile due to expansion and contraction, the cement cannot be expected to remain indefinitely.

Here was a situation in which the product in question had several good points to its credit, but some bad points that had to be considered. In other words, to take advantage of certain qualities which the tile roof had, it was necessary to make certain sacrifices; namely, the greater investment of capital in re-enforcement of the sub-structure to support the weight of the roof.

It is, therefore, not surprising that engineers should have turned their attention to the matter of imitating a product that so obviously had taken the public eye, with the idea in mind to take advantage of the good points of the clay tile and at the same time employ a material (sheet metal) whose weight is only about one-fifth as great as that of the clay tile, while at the same time permitting a considerable reduction in the amount of expenditure for sub-structure.

And as so often happens, in try-

A Home in Oklahoma City, Okla.

ing to accomplish one thing, we sometimes stumble onto ways of accomplishing more than we expected to at the outset. The matter of cementing was automatically done away with in the placement of the metal tile. The original color could be easily duplicated with paint.

So well have the engineers succeeded in their original intention of imitating a popular product which, however, had certain disadvantages, that they have actually come to the point where the imitation is admittedly better than the original. The new product removes entirely all of the inherent objections to the original and actually gives better service than the former did.

In the matter of length of service the metal tile has far outdistanced the clay tile. In appearance the metal tile has everything the clay tile has, and in addition it has the virtue of not requiring cementing. It is fire-proof and non-corrosive. It has less weight.

In view of these facts, it is again not surprising that the metal tile roof idea, which incorporates all of the virtues of the Spanish clay tile with the added virtue of having none of the latter's disadvantages should have gained indisputable popular favor. It is now rapidly invading the once seemingly impregnable strongholds of the Spanish clay tile even to the extent of being looked upon with favor in what is known as the pretentious mansion type of dwelling.

As proof of this we present the two accompanying illustrations of metal tile as it appears doing service on two of the mansion type dwelling. The one is Spanish Mission tile on the residence of 3703 North McKinley Street, Oklahoma City, Oklahoma. This roof has already had five years of service and gives absolutely no sign of wear. No repairs have been required. The other photo is that of the dwelling of Honorable H. P. Jordan, 2111 Austin Avenue, Waco, Texas. The structure was erected seven years ago, and the metal tile roof was laid by Torbett & Germond Company, sheet metal contractors, Waco, Texas. The tile on this home was manufactured by the Edwards Manufacturing Company.

Here are two examples of steel not only equalling but improving upon the natural beauty of these dwellings. This type of work can be done and sheet metal contractors who are on to their jobs are getting just this type of work. Certainly a goal for the younger sheet metal men to aim at. The photographs were loaned to us through the courtesy of the Sheet Steel Trade Extension Committee.

Four New Oxygen Plants Increase Linde Service

Four new Linde plants have recently started production of oxygen and are now serving the local demand in their respective localities. On July 3, a plant at 631 South 17th Street, Harrisburgh, Pennsylvania, started operating in charge of J. J. Naber. A plant at 17th and West Lawrence Streets, Allentown, Pennsylvania, in charge of W. Barber, began production on July 18. On August 1, the Shreveport, La., plant, located at Foster and Thomas Streets, in charge of F. T. Rueger, started operating. Last of all, a plant at First Avenue and B Street, South Charleston, West Virginia, was added to the chain. Ed Pohlman is superintendent at the latter plant, which started manufacturing August 10. The opening of these plants brings the total up to 52 Linde oxygen producing plants throughout the country.

Random Notes and Sketches
By Sidney Arnold

"The essence of humor is sensibility; warm, tender fellow-feeling with all forms of existence."—Carlyle.

The other morning when our manager showed me a card postmarked Menaggio, Italy, I thought to myself (or rather out loud) A. W. Glessner, president of the Excelsior, must be on another of his globe trotting trips.

"Look again," said Miss C. "Yes, it is a Glessner but this time it is Arthur B. not Arthur W."—

Well some folks are lucky, I'll say. Here Arthur and Mrs. Glessner are just returning from a three months' trip through England, Holland, Belgium, Germany, Czecko Slovakia, Austria, Italy, Switzerland and France, while I must be satisfied with a two weeks' vacation in the Wisconsin Lake regions.

Any way I'm happy—Makes me feel important to know that an editorial man can't be spared from the job for more than a few weeks at a time, while the "big boss" of the Excelsior St. Paul branch can go away all summer.

* * *

I guess our friend Ralph Poe started something when he told me that his home town, Canton, Illinois, is such a wonderful place for fishing. I took his word for it and unselfishly in our August 11th issue, passed the information along to you folks.

Now comes a real howl from Jack Barclay (no need to introduce him, as everybody knows this quiet retiring salesman for the Chas. Johnson Company). "Say, I fished there—and if Ralph calls thirty-five dollars for one measly little fish good fishing I'll be hanged."

Well, Jack, not that I'm sticking for Ralph, you'll admit it was fine fishing for some one, wasn't it?

* * *

Les Taylor: "I only drink a cocktail on great occasions."

Dave Farquhar: "What do you call great occasions."

Les: "When I drink a cocktail."

Our friend C. D. Palmer of the J. M. and L. A. Osborn Co. certainly knows how to keep the perennial youth blooming or else he is kidding us. He just honored us with a note saying that he had just returned from his 45th "Honey-moon" and spent it enjoying the beauties of the St. Lawrence. We think that C. D. must have taken a number of semi-annual trips to have rolled up this score.

* * *

"There's a limit to all things," says Roy Harrison. "I don't mind washing the dishes. I don't mind feeding the cat. I don't mind mending my own clothes. But I'll be durned if I'll wear pink ribbons on my nightshirts to fool the baby.

* * *

Neighbor: "You say your father was injured in an explosion. How did it happen?"

Young Hopeful of Tommy Richardson: "Well, Mother said it was too much sugar, but Father said it was too much yeast."

* * *

He was dug out of a wreck of his automobile and carried into the nearest doctor's office.

"I can't do anything for this man," said the doctor. "I am a veterinary surgeon."

"You're the right man, doc," said the amateur motorist. "I was a jackass to think I could run that machine."

* * *

Bill Laffin found some holes in his socks and said, "Wifie, dear, why haven't you mended these?"

"Hubby, darling, did you buy me that coat you promised?"

"N-no."

"Well, if you don't give a wrap, I don't give a darn."

* * *

Mrs. Harry Dettmers, Chicago.—"I'm sure that language on the phone is quite uncalled for."

Mr. Dettmers—"So is the number they've given me."

Say, boys, if you want to see two busy, happy fellows, just full of enthusiasm, you ought to get a look at Roy Walker and L. D. Burroughs, president and sales manager, respectively, of the Midland Furnace Company, who paid us a short visit this week. "Things are humming in Columbus; just watch our smoke," they say.

* * *

A Scotchman was discovered wandering around Detroit with a pair of rumpled trousers over his arm. "Can I help you in any way?" asked Stewart L. Coxford, Sales Manager of the Stearns Register Company. "Man," replied the Scot, who was evidently a newcomer, "I'm looking for the Detroit Free Press."

* * *

H. V. Jamison, Advertising Manager, American Sheet and Tin Plate Company: "Just a little thing it is but one which only the fortunate few may possess, and yet it solves one of the world's oldest hygienic problems in a newer and better way. Consequently, it will enhance my prestige with the neighbors, make me the center of attraction at our country club and show the world that I understand the gentle art of living. Because it keeps away those foul minions of disease which prevent health from playing on my side, it is a great service to humanity, a boon to the tired housewife I married and something which my daughter should know about. I am looking for one in bright, nickel-chrome tin-plate with extra heavy, detachable 'Swing-Shut' lid, guaranteed to keep off prowling animals for three years. Mounted upon a beautiful Renaissance base made of choicest woods from the Old World, this receptacle for kitchen refuse will harmonize with my Early Colonial back yard."

Salesman: "Oh, you want a garbage can!"

Jamison: "In a word, yes."

* * *

My son, I've traveled round the world,
And many maids I've met;
There are two kinds you must avoid
The Blonde—and the Brunette!

View of Warm and Cold Air Ducts in Kilns Before Partitions Were Put In

Warm Air Heating System Now Being Tried in Lumber Drying Plant

System Gives Promise of Effecting Enormous Economies

By George Duerr

CAN a warm air heating system be successfully employed to remove the native moisture of green wood before the wood can be used for commercial purposes?

We have seen the warm air heating system outdistance its rivals in the matter of giving health and comfort economically in the private dwelling, regardless of the size of the latter.

In the heating of factories, work shops and public garages it has permitted economies that were undreamed of by the most visionary of engineers.

In paint drying plants it has greatly increased the capacity of the drying ovens by cutting down the drying time, and producing a better quality of dried paint surface than

Furnace Room Showing Main Warm Air Duct Taken Off Furnace

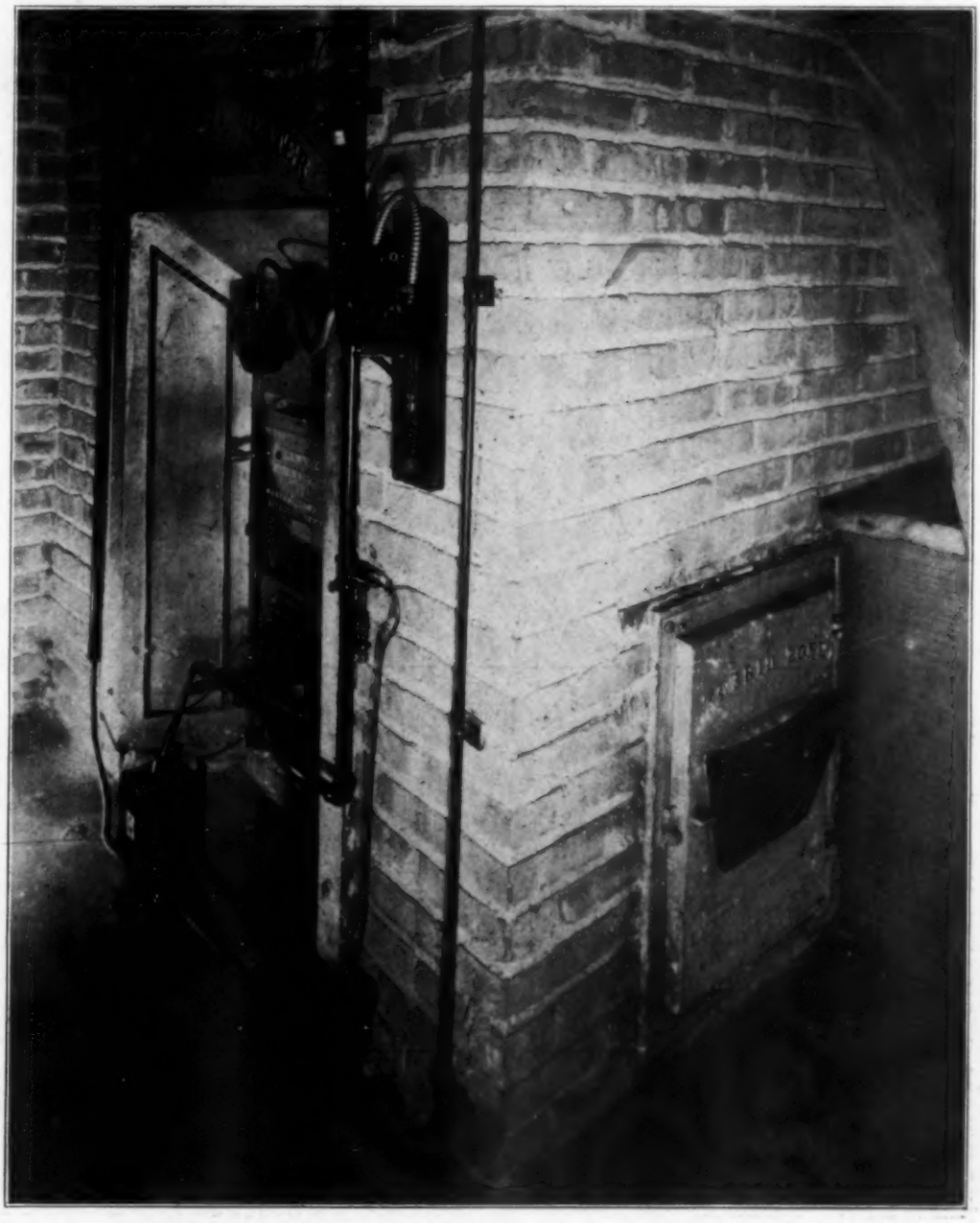
is possible with the steam coil system.

And now the warm air heating system is on the way toward a successful invasion of another field much more difficult than any of the others attempted heretofore, but much more glorifying for the industry if the anticipated results materialize, which preliminary tests bid fair to prove that they will.

It is common knowledge that, regardless of the purpose for which they are to be used, all woods must be subjected to a drying or seasoning process before they can be put to use. This drying process is a very ticklish proposition, as, of course, if the woods are not dried evenly, they split, crack, warp and become twisted to such an extent as to seriously discount their utility.

The United States Department of Agriculture, through its Forest Products Laboratory, located at the University of Wisconsin, Madison, Wisconsin, has made a detailed study of the drying of woods and their several reactions to the application of the drying processes, together with the principles involved.

"A study of these principles," says J. S. Mathewson of the Forest Products Laboratory, in a letter to the editor of AMERICAN ARTISAN, "will indicate that the satisfactory



Appearance of Furnace Front Showing Oil Burner Attachment

drying of stock is dependent primarily on properly conditioning the air with respect to temperature and humidity rather than on the particular means by which the conditioning is accomplished."

By nature the warm air heating system is better equipped to condition the air than any other means of heating, because of the fact that the moisture content of the air which passes through the systems to the rooms beyond can be positively controlled. Therefore it can be reasonably assumed that that type of system when properly constructed would be able to perform the work of drying wood in a much more satisfactory manner than the steam or hot water systems.

Acting upon this assumption, one firm of wood dryers, drying woods for pattern making, have installed a system that is akin to that which the Forest Products Laboratory designates in its "Kiln Drying Handbook" as the "Blower Kiln." The air circulation in the system about to be described, installed by a prominent Chicago warm air fur-

nace installer, produced by a blower, and the heating unit is a large warm air furnace, fired with an oil burner and thermostatically controlled. Allow the fact to be paranthetically injected at this point that the importance of air circulation in the kilns is well established in the handbook mentioned.

The entire system consists of six kilns connected in series by a trunk line system of ducts. The entire length of these ducts is 83 feet. An 8-inch brick casing surrounds the furnace, while the whole is located in a 12-inch brick fireproof room equipped with automatic fire doors. The capacity of the system is 55,000 B.t.u. per hour. The blower is operated by a 5 H.P. motor.

Some idea of the size of the main duct can be gained from the knowledge that the main duct is 24x72 inches. This reduces first to 24x54 and then to 24x30, while the drops as seen in the illustration are 12x30 inches. These ducts are all made of 22-gauge galvanized iron, and about two tons of metal were used to complete the job.

The warm air outlets are located in the 12x30 drops as shown in the illustration on page 143. The system is constructed on the recirculating principle, and the air is drawn back to the furnace through a trunk line system located on the bottom of the kilns and is divided into two lines. The cold air openings can also be seen in the illustration on page 143. A further saving in the amount of fuel burned is effected in this way, because of course, the air drawn back to the furnace is not cold by any means. A damper is located in the furnace room near the blower so that cold air can be taken in from the outside if this should be found desirable or necessary for any reason. At the present time this damper is kept closed.

Each kiln is equipped with what are known as humidity vents in the ceilings of the kilns. Thus the moisture which arises from the drying wood is enabled to escape and the drying process is further facilitated. The kilns themselves, although not actually insulated in the true sense of the word, are specially constructed to hold the heat in them. The shop is arranged so that trucks drive into it from the outside and stop opposite the kiln to be loaded. The inside wall of the kiln—that is, the wall that faces the driveway on the inside of the building, is equipped with a large canvass (shown in the illustration on page 146) which is rolled up out of the way while the kiln is being loaded and is used to cover the side of the kiln when the

Exterior View of Kilns Showing Canvas Sides

JOB RECORD

W. F. WAHLER

SHEET METAL WORKS 3717 Elston Avenue Phone Irving 1372

No..... Estimate No..... Date.....192

MR.....

Address.....

Kind of Work.....

DATE		DONE BY	MATERIAL USED	SELL	

Job Record Form Used by William F. Wahler Who Installed the Lumber Drying Plant

heat is turned on. In loading the kilns, the wood is so stacked in them as to permit free circulation of air throughout the entire pile. And the fact that the air is being forced into the kilns insures an even drying of all the lumber. In the case of the steam drying plant the lumber that was nearest the steam coils was treated to an overdose of the heat, while that in the center of the pile did not get as much, consequently there was an unevenness in the drying process with the steam plant. In the case of the warm air drying plant the wood was dried in the nearest approach to nature's way of drying. The currents of air created by a fan, blower or by gravity and carrying the B.t.u.'s wiped from the furnace surfaces are analogous to the winds of nature that are gently wafted to and fro.

In this system the requirements called for 120 degrees of heat at zero outside temperature. The drying with the steam system required the minimum of eight days. The warm air system cut that time to five and six days, thus cutting off two and three days from the firing period per kiln of wood dried, thus one big saving was brought about. On the other hand, the warm air drying process resulted in the elimination of the spotted, twisted and brashy lumber, eliminating the waste in the wood and giving the customer a much cleaner wood than could be had with the steam drying plant. That was the second manner in which the warm air heating system revealed its superior merits.

In addition to effecting economies in the fuel requirements for the heating system and turning out a product in which the wastage was largely done away with, the warm air system produced the further result of bringing the wood from a humidity of from 18 to 40 per cent down to 2 per cent, while the lowest that could be obtained with the steam system was 4 and 5 per cent and that only under the most favorable circumstances.

Thus again we see the warm air heating system triumphing over steam and hot water not only in the domestic field where its duties are the provision of heat for the home, but in the industrial field as well, its special qualities are being recognized by and taken advantage of by the manufacturer, processor and fabricator.

The drying of wood for pattern making is a very particular process. The wood must be thoroughly seasoned and in such a way that it can be easily machined into the shapes and forms desired. Wood not thoroughly seasoned will shrink and thus render the pattern useless. Wood that is bowed or twisted can not be used for obvious reasons. Therefore when the warm air heating system can be made to do the work satisfactorily upon which the steam system has fallen down, this is indeed an indication of the superior merit of the former system.

This commercial use of the warm air heating system could be greatly extended. There are at the present time many manufacturing processes that require wood that is thoroughly seasoned. But the ordinary seasoning method employed at the present time, that of piling lumber in the yard in great piles and allowing it to stand for months at a time, is an antiquated method of doing things. It requires the tying up of enormous funds of capital in lumber, because the large scale production or mass production requires that material be on hand so that the shop can be kept running five days in the week, and lumber must be purchased months in advance and allowed to dry.

Are Warm Air Furnace Installers "Kidding" Themselves That They Are Using the Code?

Many Think They Are Making Code Installation When They Are Not

By R. P. Whitmer*

WE are conducting intensive propaganda among all of our dealers for the purpose of getting them to use the Standard Code.

We have found the following to be the facts and we believe that they apply not only to our dealers, but to dealers of practically all furnace companies:

1—Most dealers, while they give lip acquiescence to the Standard Code, are not actually using it.

2—Those who really do try conscientiously to use it, find it too long for some of their quick estimating, and as a consequence, in quick estimating, do not use it.

3—There does not seem to be any well organized estimating sheets for estimating Standard Code requirements, except that furnished by the National Warm Air Heating Association. That sheet does not make any provision for heat loss through floors in unexcavated spaces and heat loss through the ceiling.

4—Many warm air furnace installers think they are using the Standard Code and they are only using part of it. They are dividing by 800, 60, and 12 and multiplying by nine, but they are not making corrections for below zero outside temperature where the locality requires it. In many instances, we also find that they are not making allowances for ceiling losses, one of the most important features entering into the correct calculation of heat losses. The same is true of unexcavated basements.

We have come across what we are pleased to term the Standard Code Computing Rule and have adopted it for our own engineering department's quick estimating on gravity furnace heating.

We have made up what we call our Computing Rule Data Sheet for the purpose of aiding our dealers to use the Standard Code Computing Rule.

We are making a distribution of both the Standard Code figuring blank for figuring jobs and of our Computing Rule Data Sheet to all dealers who are interested in figuring real Standard Code jobs quickly and accurately.

We are not distributing these in quantities free of charge, but are selling them at our actual cost of reprinting, not original set-up of type, but reprinting. We are only asking the dealers to pay for the cost of running off their quantities, while we are paying for the cost of

*Secretary, American Foundry and Furnace Company, Bloomington, Ill.

When referring to this sheet ask for "Computing Rule Sheet."

HOUSE FURNACE STANDARD CODE COMPUTING RULE DATA SHEET

(FOR USE WITH STANDARD CODE COMPUTING SLIDE RULER ONLY)

BUILDING _____ BUILDING FACES _____ DRAWING No. _____ DATE _____

LOCATION _____ TEMPERATURE REQD. _____ ° to 70° (see note 7) FIGURED BY _____ CHECKED BY _____

Add 10% for North, Northwest, Northeast Exposure.
Add 10% for East, West, Southeast, Southwest Exposure.
Add Nothing for South Exposure.

VALUES USED 20"

Room Exposure	Name of Room	Size of Room: Length	Width	Height	Cubic Contents (Length Times Width Times Height)	Glass Area (value used 12)	Net Wall Area	Floor Area	Ceiling Area	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

TOTAL OF THIS COLUMN DETERMINES SIZE OF FURNACE TO BE USED

DIVIDE TOTAL OF THIS COLUMN BY NUMBER OF COLD AIRS TO BE USED TO DETERMINE AREA OF EACH COLD AIR PIPE

TABLE "A"—(See Standard Code)

WALLS

No. 1.	Frame wall constructed of siding, paper, sheathing, studding, lath and plaster	60
No. 2.	Frame wall constructed of siding or stucco direct to sheathing (no paper), lath and plaster	52
No. 3.	9" Brick Wall (no plaster)	40
No. 4.	9" Brick Wall plastered one side	48
No. 5.	9" Brick Wall, air space, furred and plastered	65
No. 6.	13" Brick Wall (no plaster)	53
No. 7.	13" Brick Wall, plastered one side	57
No. 8.	13" Brick Wall, air space, furred and plastered	75
No. 9.	4" Brick, 4" hollow tile, plastered	55
No. 10.	4" Brick, paper, sheathing, studding, lath and plaster (brick veneer)	60
No. 11.	8" Hollow tile, stucco and plaster	67
No. 12.	8" Hollow tile, stucco, furred and plastered	90

ROOFS

No. 13.	1" T & G. Sheeting, Tar & Gravel	40
No. 14.	1" T & G. Sheeting & Composition roof	40
No. 15.	1" T. & G. Sheeting & Tin	24
No. 16.	Corrugated Iron on strips	9.3

CEILINGS

No. 17.	Lath and plaster without floor above	50
No. 18.	Lath and plaster with tight floor above	80
No. 19.	Metal without floor above	45
No. 20.	Metal with tight floor above	70

EXPLANATORY NOTES

Note 1. In obtaining glass surface use full casement opening. An outside door is figured as glass. Value 12 is always used for glass.

Note 2. To obtain net outside wall multiply height by width and deduct the glass in all windows and outside doors. For all rooms with attic spaces immediately above full ceiling areas shall be taken into account, using Table A. Floors over unexcavated spaces shall be figured as 50% exposed wall and fully exposed floors shall be figured as 100% exposed wall. (On this sheet this means if floor unexcavated, divide total floor area in half and put down that figure. If unexcavated part is exposed to outside air use full floor area.) Use same value for exposed floor that you did for exposed wall.

Note 3. [illegible]

Note 4. [illegible]

Note 5. [illegible]

Note 6. [illegible]

Note 7. [illegible]

Note 8. [illegible]

CLIMATIC CONDITIONS COMPILED FROM U. S. WEATHER BUREAU RECORDS

State	City	Average Temperature October 1–May 1	Lowest Temperature	Average Wind Velocity Dec., Jan., Feb., Miles per hr.	Direction of Prevailing Wind, Dec., Jan., Feb.
Ala.	Mobile	57.7	— 1	8.3	N
	Birmingham	53.9	—10	8.6	N
Ariz.	Phoenix	59.5	16	3.9	E
	Flagstaff	34.9	—25	6.7	SW
Ark.	Fort Smith	49.5	—15	8.0	E
	Little Rock	51.6	—12	9.9	NW
Cal.	San Francisco	54.3	29	....	N
	Los Angeles	58.6	28	....	NE
Colo.	Denver	39.3	—29	7.4	S
	Grand Junction	39.2	—16	5.6	SE
Conn.	New Haven	38.0	—14	9.3	N
D. C.	Washington	43.2	—15	7.3	NW
Fla.	Jacksonville	61.9	10	8.2	NE
Ga.	Atlanta	51.4	— 8	11.8	NW
	Savannah	58.4	8	8.3	NW
Idaho	Lewiston	42.5	—13	4.7	E
	Pocatello	36.4	—20	9.3	SE
Ill.	Chicago	36.4	—23	17.0	SW
	Springfield	39.9	—24	10.2	NW
Ind.	Indianapolis	40.2	—25	11.8	S
	Evansville	44.1	—15	8.4	S
Iowa	Dubuque	33.9	—32	6.1	NW
	Sioux City	32.1	—35	12.2	NW
Kan.	Concordia	38.9	—25	7.3	N
	Dodge City	40.2	—26	10.4	NW
Ky.	Louisville	45.2	—20	9.3	SW
La.	New Orleans	61.5	7	9.6	N
	Shreveport	56.2	— 5	7.7	SE
Me.	Eastport	31.1	—23	13.8	W
	Portland	33.6	—17	10.1	NW
Md.	Baltimore	43.6	— 7	7.2	NW
Mass.	Boston	37.6	—13	11.7	W
Mich.	Alpena	29.1	—27	11.3	W
	Detroit	35.4	—24	13.1	SW
	Marquette	27.6	—27	11.4	NW
Minn.	Duluth	25.1	—41	11.1	SW
	Minneapolis	29.6	—33	11.5	NW
Miss.	Vicksburg	56.0	— 1	7.6	SE
Mo.	St. Joseph	40.3	—24	9.1	NW
	St. Louis	43.3	—22	11.8	NW
	Springfield	43.0	—29	11.3	SE
Mont.	Billings	34.7	—39	....	W
	Havre	27.7	—57	8.7	SW
Neb.	Lincoln	37.0	—29	10.9	N
	North Platte	34.6	—35	9.0	W
Nev.	Tonopah	39.6	— 7	9.9	SE
	Winnemucca	37.9	—28	9.5	NE
N. H.	Concord	33.4	—35	6.0	NW
N. J.	Atlantic City	41.6	— 7	10.6	NW
N. Y.	Albany	35.1	—24	7.9	S
	Buffalo	34.7	—14	17.7	W
	New York	40.3	— 6	13.3	NW
N. M.	Santa Fe	38.0	—13	7.3	NE
N. C.	Raleigh	49.7	— 2	7.3	SW
	Wilmington	53.1	5	8.9	SW
N. D.	Bismarck	26.5	—45	....	NW
	Devil's Lake	18.9	—44	11.4	W
Ohio	Cleveland	36.9	—17	14.5	SW
	Columbus	39.9	—20	9.3	SW
Okla.	Oklahoma City	48.0	—17	12.9	N
Ore.	Baker	34.1	—20	6.0	SE
	Portland	45.9	— 2	6.5	S
Pa.	Philadelphia	41.9	— 6	11.0	NW
	Pittsburgh	40.8	—20	13.7	NW
R. I.	Providence	37.6	— 9	14.6	NW
S. C.	Charleston	56.9	7	11.0	N
	Columbia	53.7	— 2	8.0	NE
S. D.	Huron	28.1	—43	11.5	NW
	Rapid City	32.3	—34	7.5	W
Tenn.	Knoxville	47.0	—16	6.5	SW
	Memphis	50.9	— 9	9.6	NW
Texas	El Paso	53.0	— 2	10.5	NW
	Fort Worth	54.7	— 8	11.0	NW
	San Antonio	60.7	4	8.2	N
Utah	Modena	38.1	—24	8.9	W
	Salt Lake City	40.0	—20	4.9	SE
Vt.	Burlington	29.3	—37	12.9	S
Va.	Norfolk	49.1	2	9.0	N
	Lynchburg	45.2	— 7	5.2	NW
	Richmond	47.4	— 3	7.4	S
Wash.	Seattle	45.3	3	9.1	SE
	Spokane	37.5	—30	....	SW
W. Va.	Elkins	38.8	—21	4.8	W
	Parkersburg	41.9	—27	6.6	S
Wis.	Green Bay	28.6	—36	12.8	SW
	La Crosse	31.2	—43	5.6	NW
	Milwaukee	33.0	—25	11.7	W
Wyo.	Sheridan	31.0	—45	5.3	NW
	Lander	28.9	—36	3.0	NE

the original set-up of type.

The Computing Rule Data Sheet has been found to be practical in actual operation and our dealers are really using it. Every day I get in letters from dealers now, asking opinions as to various heating matters, and each one sends his Computing Rule Data Sheet properly filled out, from which we quickly make the necessary calculations.

We believe that this is a real step forward in figuring warm air heating jobs, and will be pleased to send Computing Rule Data Sheets to any one who is interested in them.

Table A of the Standard Furnace Code, including the explanatory notes of the code, together with information concerning register and pipe sizes, is also included in the data sheet.

Furnace Manufacturers Are Looking to a Good Season

Personal calls by members of AMERICAN ARTISAN staff on the trade the past few weeks, and the statements of visitors at our offices reveal quite an optimistic spirit.

The following letter showing this same spirit has just been received from Richardson & Boynton Company:

"Promise of a good season in the heating industry is forecast in the announcement recently made by the Richardson & Boynton Company, that all of their plants are now in full operation.

"Their newly acquired plant at Utica, N. Y., one of the most modern and complete plants in the country, is in full production, with orders ahead sufficient to maintain that schedule for an indefinite period.

"In addition, foundry facilities of the company are operating in a most satisfactory manner. Production is now well up to any demand.

"This full time basis of production not only places the company in a most advantageous position as regards shipments, but it also forecasts a season of activity that is expected to compensate for past months that have been regarded, in general, as disappointing.

"All the plants of the Richardson & Boynton Company are devoting their facilities to the production of warm air heaters, including the newly acquired Utica line, both cased and uncased.

"In spite of the additional production problems which the consolida-

tion with the old Utica Heater Co., brought about, the company states that its foundry facilities have been and are equal to the task, and are now making immediate deliveries on all lines."

And a Good Time Was Had by All

Yes, each and every one of the three hundred or so Illinois and Chicago hardware folks who picnicked at Wing Park, Elgin, Wednesday, August 22nd, will remember this outing as one of real pleasure.

Some golfed, some played ball, others tennis; the kiddies and at least a few of the grown-ups rode on the merry-go-rounds, did the stunts in the playgrounds; in fact, everybody did as they pleased, with one thought in mind—"We are here for fun and fun we are going to have."

The baseball game between the Chicago dealers and, as Secretary P. M. Mulliken said, "the rest of the world" would have been a lesson to the big leaguers—6 to 5 in favor of Chicago, and a hard won game at that.

Yes, a good time was had by all, and now the Illinois folks are all working to make the 1929 convention, to be held at the Hotel Sherman, Chicago, February 12, 13 and 14, the biggest and best yet.

Does Moist Air Save Fuel?

Moist air is more comfortable at 70 degrees than dry air is at 75 degrees. Some heating engineers claim that moist air saves fuel; others claim that the amount of heat required to evaporize the water is substantially equal to the amount of heat saved by using a lower temperature where you have a higher humidity. According to this heating engineers do not agree, but nevertheless, our experience shows a saving of fuel where moist air up to 50 per cent is used.

There is no question about using heat units to evaporate water. Everybody knows it takes heat to make steam and some of the heat units of your heating plant will be used to evaporate the water into moist air.

We believe that most of the heating engineers are correct in their assertions, but do not go far enough in their explanations as to the reason for fuel saving or not. Our observation and experiments have shown that there is a difference, and we term this difference a fuel saving. There isn't a warm air heating plant in existence but what wastes fuel because of dry air. The tendency is to fire up when we feel cold because of excessive dryness, and thus our heating plants are forced to such an extent that at times the home will register as high as 80 degrees above. If we were in a 50 per cent moist air atmosphere all the time, this excessive heat would not be required, consequently there would not be a fuel waste. In other words, it is not so much "fuel saving" as it is "fuel waste." I actually know from experience that there is a lot of fuel wasted by not keeping the rooms of the home up to the proper amount of moisture.

The difference in heat units used in dry air as against moist air to 50 per cent in the average home would be more than the number of heat units it would take to evaporate the water necessary to bring the moist air to 50 per cent, because the average dry home uses a higher temperature than it should, which is a sure and proven evidence of fuel waste.

Some heating engineers claim the vapor pan should be where the hottest air passes over it and that it should be kept full automatically. If this is correct, we would like to know how a perfect per cent of moisture can be maintained when one furnace is installed with proper circulation and the other without proper circulation. It is not a correct way to maintain proper moisture. There should not be a quantity of water where the hottest air passes over the vapor pan, but it should be put into the vapor pan by a drip system and evaporated as soon as it comes in. If the heat of the furnace controls the drip to the amount needed, a more perfect per cent of moisture can be obtained and will not be intermittent.

If a body of water is maintained in the vapor pan, where it is not continually agitated, a lime scum forms, and in real cold weather when the fire is strong, the water boils, causing the scum to break, and for a time too much moisture is experienced, thus causing too much condensation (or sweat) on windows and walls. When the fire is low you do not get enough moisture.

What everybody needs is 50 per cent humidity. It does not make any difference how much water it takes to get the 50 per cent moisture; some engineers claim it takes one gallon per room every 24 hours, but it does not make any difference whether it takes one gallon or 24 gallons per day as long as you get the 50 per cent moisture.

It takes more water in some homes than in others, depending on the construction of the home or the conditions in the home, but we must have moisture in any home where artificial heat is used.

Prest-O-Lite Company Adds Two New Plants

The Prest-O-Lite Company, Inc., has lately added two new plants to its nation-wide chain making the total 33. These will serve nearby industry with dissolved acetylene, used in oxy-acetylene welding and cutting. A plant in charge of H. A. Smith at 631 South 17th Street, Harrisburgh, Pennsylvania, started production on July 12th, and another at 17th and W. Lawrence Streets, Allentown, Pennsylvania, J. W. Summers, Superintendent, commenced operations on July 21st.

Try this out and see if you get the same total:

In what year were you born?....
What is your age? ....
In what year did you take your present position? ....
How many years have you worked at this job? ....
Total 3856

Milk Can Bottoms

From Livingston Sheet Metal Works, Livingston, Montana.

Can you inform us where we can buy milk can bottoms?

Ans.—National Enameling and Stamping Co., Milwaukee, Wisconsin; American Can Company, 104 South Michigan Avenue, Chicago; Republic Metalware Company, Buffalo, New York.

Cast Iron Smoke Pipe

From C. B. Rose & Son, Louisiana, Missouri.

Will you please tell me who makes cast iron furnace smoke pipe and elbows?

Ans. — Waterloo Register Co., Waterloo, Iowa.

SPOT NEWS

W. W. Langworthy has engaged in business in Marshfield, Ore., as the Coos Bay Sheet Metal Works.

V. W. Wendlick and A. G. Ross have engaged in business in Portland, Ore., under name of Pacific Furnace & Sheet Metal Co.

A. G. Long & Co., formerly of Procter, Minn., have engaged in the sheet metal business in Bloomer, Wis., and will do heating, ventilating, roofing and other work.

The Bloomington Sheet Metal Works, 3736 Chicago Avenue, Minneapolis, Minn., has the roofing contract for a dwelling in Eau Claire, Wisconsin.

Schupert & Koudelka, Iowa City, Iowa, have the sheet metal and tin work on the Paul L. Hummer warehouse at that point.

The Duncan Sheet Metal Co., 721 Tuttle Street, Des Moines, Iowa, has been awarded the sheet metal contract for addition to high school in Sigourney, Iowa.

The Hawkeye Tin Shop, 96 2nd Avenue, East, Cedar Rapids, Iowa, has the heating contract for the Henry S. Ely residence.

The Hastings Sheet Metal Works, Hastings, Nebraska, has the furnace contract for Mads Anderson residence in that city.

The Iowa City Sheet Metal Company, Iowa City, Iowa, has the contract for the sheet metal work on the American Legion building at that point.

The Manhattan Sheet Metal Company, Manhattan, Kansas, has been awarded the heating contract for Memorial Hospital in Lawrence, Kansas.

The Pittsburg Cornice Works, Pittsburg, Kansas, has been awarded the heating and ventilating contract for the Eugene Field Grade School in that city, at $11,350.

The Tullis Sheet Metal Works, 2204 East Douglas, Wichita, Kansas, has been awarded the heating and sheet metal contract for the H. M. Corbett residence at 93 Faulkner Avenue.

The Acme Heating Company has been incorporated in Oakland, Cal., by H. C. Kelsey of Oakland and Albert D. Ayres and J. M. Guinn of Reno, Nevada. The same people are engaged in business under the same name in Reno.

B. F. Shell, 11 East Washington Street, Petaluma, California, has been awarded the sheet metal contract, and Michel & Pfeffer Iron Works, Harrison and Tenth Street, San Francisco, Cal., the sheet sash contract for Poultry Producers warehouse in Petaluma.

The Guilfoy Cornice Works, 1234 Howard Street, San Francisco, California, has been awarded the sheet metal contract for Bank of Italy building in Watsonville, California.

The Standard Sheet Metal Co., Palo Alto, California, has been awarded the sheet metal contract for the Bank of Italy building at that point.

The Hodge Sheet Metal Works, Los Angeles, California, has been awarded the sheet metal contract for the United Artists building.

The Home of the Cone Co., 413 East Broadway, Glendale, has contract for construction of sheet metal store buildings for Alfred H. Prince and Nels Christensen, in San Fernando Annex, Los Angeles, California.

Alfred Anderson and Bernice D. King have engaged in business at 206 N. San Fernando road, Glendale, California, under name of both Paramount Sheet Metal Works, and Paramount Ornamental Iron Works.

P. J. Jeffway is establishing an ornamental iron works shop at 824 Colorado Street, Santa Monica, California.

Alfred Gantert and N. Macmillan have engaged in business at 1412 Vermont Avenue, Los Angeles, California, as Standard Metal Weather Strip Company.

The United Products Company has been incorporated in Detroit, Michigan, with an authorized capital stock of $50,000, to engage in the ornamental sheet metal work and roofing business at 4246 Grand River Avenue.

The Western Sheet Metal Works, Inc., has been chartered in St. Louis, Missouri, by Gus H. Becker, 50 Lewis Place, and others.

The Fanaire Heater Company has been incorporated in St. Louis, Missouri, by Carlyle Emery, 5502 Delmar Street, and others.

Be Sure to Install According to Standard Code Says Chicago Daily News

Every little helps. The following is an item which appeared in the Chicago Daily News architectural section which shows that people inquiring for information on warm air heating are being given the correct "dope" by the Daily News:

"Q.—The man who I plan to have install my warm air furnace says that a connection to outside air, as we had on our old house, is not necessary. How can you get fresh air without it?

"A.—The modern principle of warm air heating plants is to recirculate the air. This is economical, scientific, requires no additional air taken from outside the house. As a matter of fact, the changes of air in a house built as ordinarily are frequent. Be sure to have your furnace man install in accordance with the standard code of the National Warm Air Heating association."

Iron and Steel Demand Keeps Strength

Production Stays at High Levels—Prices Harden—Pig Iron in Middle West Is Higher

IRON and steel demand, greatly accelerated in recent weeks, shows no signs of diminishing. On the contrary, good as the market is at present, the brightest part of the picture is the assurance of sustained and broadening activity. Buying of all classes of steel continues heavy, and while the automotive industry has been one of the chief mainstays of the market, a wider range of interest is apparent. The stronger tone of the market is largely responsible for an unusually heavy run of specifications on this quarter's contracts.

Structural Awards Continuue Substantial

Several substantial awards are noted in the structural shape market, although most of the tonnage now being placed on mill books represents a large aggregate of moderate size orders.

Sheet specifications have increased substantially as consumers show more eagerness to take all that is due them on third quarter contracts, especially in view of the advance in black and galvanized for fourth quarter. Jobbers are laying in heavy supplies, due to the decrease in discount, now more generally followed, and to strengthening prices. Some manufacturers in the Middle West have already closed on fourth quarter sheet needs. The leading maker at Pittsburgh reports last week's orders were the heaviest of any week since November, 1925. It has followed the independents in adopting 2.75 cents for black and 3.60 cents for galvanized for fourth quarter, with blue annealed continuing at 2.00 cents to 2.10 cents and autobody at 4.00 cents. Mill operations now are as close to capacity as weather conditions will permit.

Wants 50,000 Tons of Pipe

Sheet production by independents reporting to the National Association of Flat Rolled Steel Manufacturers dropped to 267,685 tons in July, the lowest point since December, 1927. Shipments were reduced to 278,310 tons, smallest since January, 1928. Sales, however, increased to 333,357 tons, largest since March. Demand from automobile and parts makers provide the bulk of heavy specifications for strip steel. Makers in the Pittsburgh district have increased operations greatly over the July rate and report the possibility of this month's output setting a record. Tin plate mills still operate close to capacity. Fourth quarter books for wire and nails have been opened at unchanged prices by a Pittsburgh maker.

Pig Iron

At Pittsburgh sustained activity in finished steel and a trend toward higher steel prices is beginning to influence pig iron. Both sales and inquiry for foundry requirements for the remainder of the year are more pronounced. All sellers talking firmer prices. Basic generally is quoted $16, valley.

Bessemer iron is firm at $17, valley. Sales are mostly in carloads.

More strength is noted in the Chicago pig iron market. Advancement of Cleveland iron to $17 has reduced the fear of competition from furnaces in that district and has stimulated Chicago district buyers into buying at present prices of $17.50 for malleable and No. 2 foundry, Chicago furnace, and $18 for foundry No. 1. Several sellers reported last week as the busiest of the summer, while all state that sales are ahead of August, 1927. Pig iron prices are stronger in Toledo and Detroit and less resistance is found in Chicago against closing at the market.

Steady deliveries have reduced Birmingham surplus stock of foundry iron. The price holds at $15.50, base, Birmingham.

Copper

Demand has not been heavy but the market has held firmly at 14.75 cents, delivered Connecticut. Some interest in October metal has been shown by users but for the most part consumers have been confining their purchases to September delivery. The trade now is said to be well covered on its September requirements. Some good export business has been done the past week and more buying for September delivery is expected.

Zinc

While buying has been slow producers have held their prices at 6.25 cents, East St. Louis, and 6.60 cents New York. Consumers have not been showing any great amount of interest. Some easing has been noted in position of ore supplies but the ore price has held unchanged.

Lead

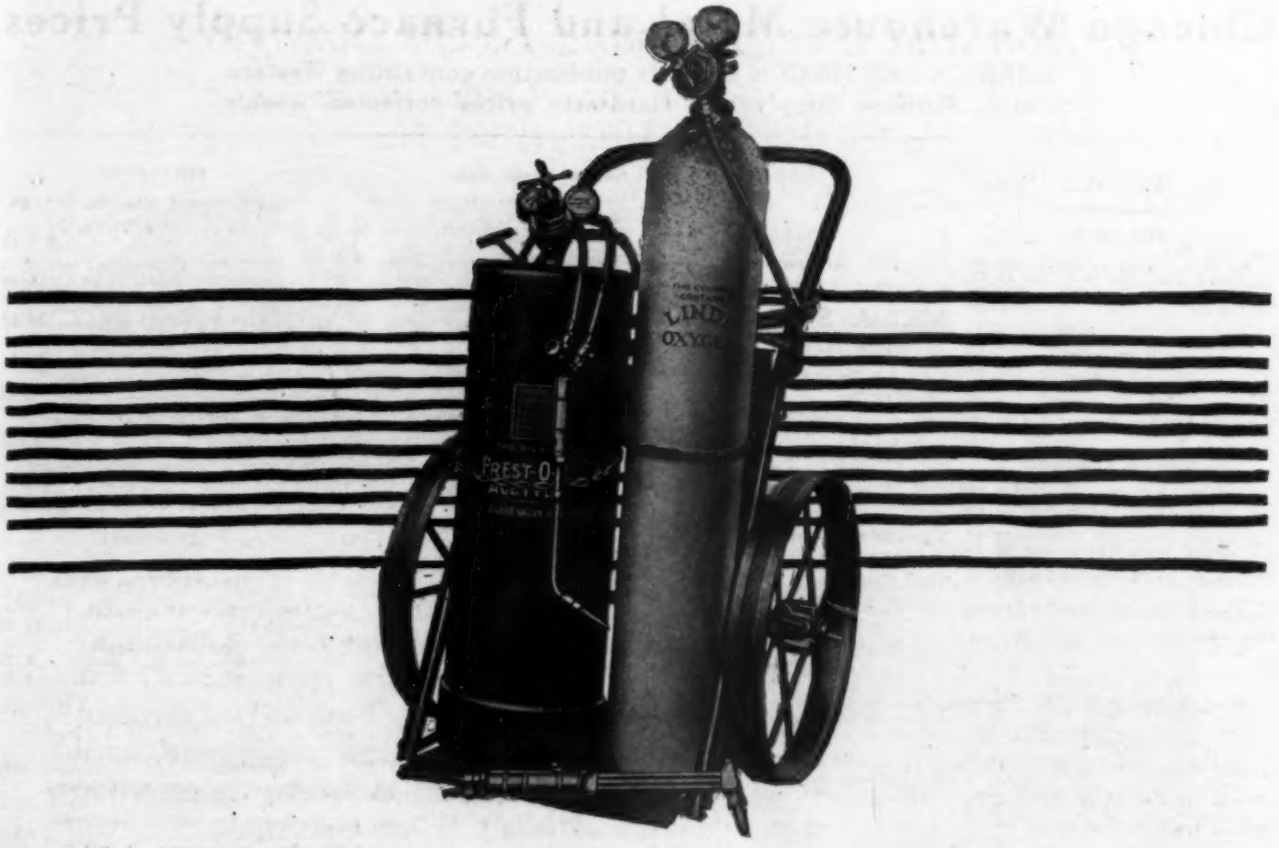
This metal has been in very active demand the past week. The market has shown considerable strength as a consequence and prices have been firmer. While 6.02½ cents, East St. Louis, has been quoted, however, the bulk of business done during the week was at 6.00 cents. The London market is stronger although during the past few days prices there have slipped off slightly.

Tin

Prices continue to fluctuate but the range has been narrow. Spot metal appears to be in a tight position but considerable easiness is noted in futures. On some days demand has been fairly active.

Old Metals

Wholesale quotations in the Chicago district, which should be considered as nominal, are as follows: Old steel axles, $15.75 to $16.25; old iron axles, $24.00 to $24.50; steel springs, $15.50 to $16.00; No. 1 wrought iron, $11.25 to $11.75; No. 1 cast, $13.00 to $13.50; all per net tons. Prices on non-ferrous metals are quoted as follows, per pound: Light copper, 10¼ cents; zinc, 3¼ cents; cast aluminum, 11¾ cents.



Why not do welding?

A GOOD mechanic can learn to use an oxy-acetylene blowpipe quickly. And with it he can do many jobs that are profitable.

Why not give yourself or your shop the benefit of this profitable business?

Prest-O-Weld blowpipes are reasonably priced and in addition they are made by the same company that makes the famous Oxweld blowpipes. That means they are good!

Sold by jobbers everywhere.

OXWELD ACETYLENE COMPANY
Unit of Union Carbide and Carbon Corporation

UCL

CHICAGO
3642 Jasper Place

NEW YORK CITY
30 East 42d Street

SAN FRANCISCO
8th & Brannon Sts.

PREST-O-WELD

Chicago Warehouse Metal and Furnace Supply Prices

AMERICAN ARTISAN is the only publication containing Western Metal, Furnace Supply and Hardware prices corrected weekly

METALS

PIG IRON

Chicago Fdy., No. 2	$17.50
Southern Fdy. No. 2	21 51
Lake Superior Charcoal	27 04
Malleable	17.50

FIRST QUALITY BRIGHT TIN PLATES

IC	20x28 112 sheets	$25 10
IX	20x28	29 60
IXX	20x28 56 sheets	16 20
IXXX	20x28	17 65
IXXXX	20x28	18 95

TERNE PLATES

		Per Box
IC	20x28, 40-lb. 112 sheets	$25 00
IX	20x28, 40-lb. 112 sheets	27 75
IC	20x28, 35-lb. 112 sheets	21 15
IX	20x28, 35-lb. 112 sheets	23 80
IC	20x28, 20-lb. 112 sheets	19 55
IV	20x28, 20-lb. 112 sheets	22 05
IC	20x28, 15-lb. 112 sheets	18 05

"ARMCO" INGOT IRON PLATES

No. 8 ga. up to and including ¼ in.—100 lbs. $4 55

COKE PLATES

Cokes, 80 lbs., base, 20x28	$13 40
Cokes, 90 lbs., base, 20x28	13 80
Cokes, 100 lbs., base, 20x28	14 00
Cokes, 107 lbs., base, IC 20x28	14 30
Cokes, 135 lbs., base, IX 20x28	16 40
Cokes, 155 lbs., base, 56 sheets	9 20
Cokes, 175 lbs., base, 56 sheets	10 05
Cokes, 195 lbs., base, 56 sheets	10 90

BLUE ANNEALED SHEETS

Base 10 ga. per 100 lbs.	$3 35
"Armco" 10 ga. per 100 lbs.	4 00

ONE PASS COLD ROLLED BLACK

No. 18-20	per 100 lbs.	$3 60
No. 22	per 100 lbs.	3 75
No. 24	per 100 lbs.	3 80
No. 26	per 100 lbs.	3 90
No. 27	per 100 lbs.	3 95
No. 28	per 100 lbs.	4 05
No. 29	per 100 lbs.	4 20
No. 30	per 100 lbs.	4 30

"ARMCO" GALVANIZED

"Armco" 24 ... per 100 lbs. $6 15

GALVANIZED

No. 16	per 100 lbs.	$4 15
No. 18	per 100 lbs.	4 30
No. 20	per 100 lbs.	4 45
No. 22	per 100 lbs.	4 55
No. 24	per 100 lbs.	4 65
No. 26	per 100 lbs.	4 90
No. 27	per 100 lbs.	5 00
No. 28	per 100 lbs.	5 15
No. 30	per 100 lbs.	5 55

BAR SOLDER

Warranted

50-50 ..... per 100 lbs. $30 75

Commercial

45-55	per 100 lbs.	27 25
Plumbers	per 100 lbs.	24 25

ZINC

In Slabs ..... $ 8 50

SHEET ZINC

Cask Lots (600 lbs.)	$11 25
Sheet Lots	12 25

BRASS

Sheets, Chicago Base	19¼c
Mill base	18½c
Tubing, brazed base	27¼c
Wire, base	18½c
Rods, base	16¼c

COPPER

Sheets, Chicago base	24½c
Mill base	23½c
Tubing, seamless base	26¼c
Wire, No. 9, B & S Ga.	19¾c
Wire, No. 10, B & S Ga.	19½c
Wire, No. 11, B & S Ga.	20¼c
Wire No. 3, B & S Ga. and heavier	

LEAD

American Pig	$7 20
Bar	8 20

TIN

Pig Tin	per 100 lbs.	$55 00
Bar Tin	per 100 lbs.	56 00

HARDWARE, SHEET METAL SUPPLIES, WARM AIR FURNACE FITTINGS AND ACCESSORIES.

ASBESTOS

Paper up to 1/16	6c per lb.
Roll board	6½c per lb.
Mill board 3/32 to ⅛	6c per lb.
Corrugated Paper (250 sq. ft. to roll)	$6 00 per roll

BRUSHES

Furnace Pipe Cleaning

Bristle, with handle, each $0 75

Flue Cleaning

Steel only, each 1 35

BURRS

Copper Burrs only 40-2½%

CEMENT, FURNACE

American Seal, .5-lb. cans, net	$ 45
American Seal, 10-lb. cans, net	85
American Seal, 25-lb. cans, net	2 25
Pecora ..... per 100 lbs.	7 50

CHIMNEY TOPS

Adams' Revolving	Wt. Doz.	Price Doz.
4 in.	21 lbs.	$11 00
6 in.	24 lbs.	11 50
7 in.	30 lbs.	13 50
8 in.	33 lbs.	15 00
9 in.	51 lbs.	16 50
10 in.	56 lbs.	18 00
12 in.	66 lbs.	23 00
14 in.	110 lbs.	36 00

CLINKER TONGS

Each $1 50

CLIPS

Damper No-Rivet Steel, with tail pieces, per gross	$9 50
Rivet Steel, with tail pieces, per gross	7 50
Tail pieces, per gross	2 40

COPPERS—Soldering

Pointed Roofing

3 lb. and heavier	per lb.	40c
2½ lb.	per lb.	45c
2 lb.	per lb.	48c
1½ lb.	per lb.	55c
1 lb.	per lb.	60c

CORNICE BRAKES

Chicago Steel Bending

Nos. 1 to 8B ..... Net

CUT-OFFS

Gal., plain, round or cor. rd.

26 gauge	30%
28 gauge	35%

DAMPERS

"Yankee" Hot Air

7 inch, each 29c, doz.		$1 60
8 inch, each 35c, doz.		2 20
9 inch, each 38c, doz.		2 60
10 inch, each 32c, doz.		2 80

Smoke Pipe

7 inch, doz.	$1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 75
12 inch, doz.	4 50

ADAMS No. 1 CHECK

Check and Collar Complete

8 inch, each	2 00
9 inch, each	2 25

End Check Only

8 inch, each	1 60
9 inch, each	1 85

Collar Only

8 inch, each	50
9 inch, each	65

No. 2 CHECK

8 inch, each	1 00
9 inch, each	1 00

10% Disc. on Adams No. 1 and No. 2 Check

Diamond Smoke Pipe

7 inch, doz.	$ 2 00
8 inch, doz.	3 20
9 inch, doz.	4 00
10 inch, doz.	

Adams' Sheet Metal

7 inch, doz.	$ 1 60
8 inch, doz.	2 20
9 inch, doz.	2 60
10 inch, doz.	2 80
12 inch, doz.	3 50
14 inch, doz.	5 00

EAVES TROUGH

Galv. Crimpedge, crated 75 & 10%

Zinc, "Barnes" 40%

ELBOWS

Conductor Pipe

Galv. plain or corrugated, round flat Crimp.

28 Gauge	60%
26 Gauge	45%
24 Gauge	15%

Galv. & Terne Steel

Plain Rd. and Rd. Corr.:

28 Ga.	60%
26 Ga.	45%
24 Ga.	15%

Square Corrugated

No. 28 Gauge	50%
26 Gauge	35%

Portico Elbows

Standard Gauge Conductor Pipe, plain or corrugated.

Not nested	70 & 5%
Nested Solid	70 & 5%

Sq. Corr., A. & B. & Octagon

28 Ga.	50%
26 Ga.	35%

Portico

1", 1¼", 1½" 45%

Copper

16 oz., all designs 50%

Zinc—

All styles 60%

ELBOWS—Stove Pipe

1-piece Corrugated. Uniform Blue "Milcor" No. 28 Gauge.

	Doz.
5-inch	$1 05
6-inch	1 20
7-inch	1 75

Special Corrugated

6-inch	$1 00
7-inch	1 60

Adjustable—Uniform Blue

"Milcor" No. 28 Gauge. Uniform Blue.

5-inch	$1 65
6-inch	1 75
7-inch	2 10

WOOD FACES—50% off list.

FENCE

726-6-12½% (100 rods)	$28 61
1042-6-14½% (100 rods)	43 62

FILES AND RASPS

Heller's (American)	50-10%
American	60-10%
Arcade	50%
Black Diamond	50%
Eagle	50%
Great Western	50%
Kearney & Foot	50%
McClellan	50%
Nicholson	50%
Simonds	60%

FIRE POTS

Geo. W. Diener Mfg. Co.	Ea.
No. 02 Gasoline Torch, 1 qt.	$ 8 10
No. 0250, Kerosene, or Gasoline Torch, 1 qt.	6 50
No. 10 Tinner's Furn. Square tank, 1 gal.	11 30
No. 15 Tinner's Furn. Round tank, 1 gal.	10 70
No. 21 Gas Soldering Furnace	8.60
No. 110 Automatic Gas Soldering Furnace	10 50

Quick Meal Stove Co.

Vesuvius, F. O. B. St. Louis 30%

(Extra Disct. for large quantities.)

GALVANIZED WARE

Pails (Galv. after made), 10-qt.	$2 00
Tubs (Galv. after made).	
No. 1	5 75
No. 2	6 50

GLASS

Single Strength, A, 52-in. brackets	88%
Single Strength, B, 34 to 40-in. brackets	88%
Single Strength, A, all other brackets	88%
Double Strength, A, all sizes	89-5%

HANGERS

Conductor Pipe

Milcor Perfection Wire	25%
Milcor Triplex Wire	10%

Eaves Trough

Milcor Steel (galv. after forming) List	plus 12½%
Milcor Selflock E. T. Wire, List	plus 50%

HOOKS

Conductor

"Direct Drive" Wrought Iron for wood or brick .. 15%

HUMIDIFIER

"Front-Rank," Automatic

In single lots	50%
In lots of 10 or more	50-5%
In lots of 25 or more	50-10%
Vapor pans, etc., each	50%

LIFTERS

Stove Cover

Coppered	per gro. $6 00
Alaska	per gro. 4 75

MALLETS

Tinners

Hickory ..... per doz. $2 25

MITRES

Galvanized steel mitres.

28 Ga.	70
26 Ga.	60-20

NAILS

Cut Steel	$4 35
Cut Iron	4 35

Wire

Common	$3 10
Cement Coated	3 10

(Continued on Page 156)

ADVERTISERS' INDEX

The dash (—) indicates that the advertisement runs on a regular schedule but does not appear in this issue.

Markets—Continued from Page 154

PASTE

Asbestos Dry Paste:

200-lb. Barrel	$16 00
100-lb. barrel	8 75
25-lb. pail	3 50
10-lb. bag	1 10
5-lb. bag	60
2½-lb. cartons	35

POKERS, FURNACE

Each $0 75

POKERS, STOVE

Nickel Plated, coil handles, per doz. 1 10
W'r't Steel, str't or bant, per doz. $0 75

PIPE

Conductor

Cor. Rd., Plain Rd., or Sq.

Galvanized

Crated and nested (all gauges) 75-7½%
Crated and not nested (all gauges) 75-2½%

Furnace Pipe

Double Wall Pipe and Fittings 50%
Single Wall Pipe, Round Galvanized Pipe 50%
Galvanized and Tin Fittings 50%

Lead

Per 100 lbs. $12 50

Stove Pipe

"Milcor" "Titelock" Uniform Blue Stove

28 gauge, 6 inch U. C. nested	10 50
28 gauge, 6 inch U. C. nested	11 00
28 gauge, 7 inch U. C. nested	12 00
30 gauge, 6 inch U. C. nested	9 00
30 gauge, 6 inch U. C. nested	10 00
30 gauge, 7 inch U. C. nested	12 00

T-Joint Made up

6-inch, 28 ga....per doz. $ 4 00

All Zinc

No. 11, all styles.....40%

PULLEYS

Furnace Tackle....per doz. $0 85
.....per gro. 8 50
Furnace Screw (enameled) .....per doz. 75

PUTTY

Commercial Putty, 100-lb. Kits $3 50

QUADRANTS

Malleable Iron Damper.....10%

REDUCERS—Oval Stove Pipe

	Per Doz.
7—6, 28-gauge, 1 doz. in carton	$3 00

REGISTERS AND BORDERS

Baseboard, Floor and Wall.

Cast Iron 20%
Steel and Semi-Steel.....40%
Baseboard, 1 piece.....40-20%
Baseboard, 2 piece.....40%
Wall 40%
Adjustable Ceiling Ventilators 40%

Register Faces—Cast and Steel

Japanned, Bronzed and Plated, 4x6 to 14x14.....40%
Large Register Faces—Cast, 14x14 to 28x42.....50%
Large Register Faces—Steel, 14x14 to 28x42.....55%

Ventilating Register

Per gross	9 00
Small, per pair	25
Large, per pair	50

RIDGE ROLL

Galv., Plain Ridge Roll, b'dld 75-15-5%
Galv., Plain Ridge Roll crated 75-15%
Globe Finials for Ridge Roll..5%

SCREWS

Sheet Metal

7, ½x½, per gross.....$0 52
No. 10, ¾x3/16, per gross 61
No. 14, ¾x¼, per gross.. 82

SHEARS, TINNERS' & MACHINISTS'

Viking $22 00

Lennox Threatless

No. 18 .....35%
Shear blades 10%
(f. o. b. Marshalltown, Iowa)

SHIELDS, ADJUSTABLE RADIATOR

No. 1 "Gem" 11" to 17".....30%
No. 2 "Gem" 14" to 24".....30%
No. 3 "Gem" 25" to 65".....30%

SHOES

Galv. 28 Gauge, Plain or corrugated round flat crimp...60%
26 gauge round flat crimp....45%
24 gauge round flat crimp....15%

SNIPS, TINNERS

Clover Leaf .....40 & 10%
National .....40 & 10%
Star 50%
Milcor .....Net

SQUARES

Steel and Iron .....Net
(Add for bluing $3 per doz. net)
Mitre .....Net
Try .....Net
Try and Bevel.....Net
Try and Mitre.....Net
Fox's .....per doz. $6 00
Winterbottom's 10%

STOPPERS, FLUE

Common .....per doz. $1 10
Gem, No. 1.....per doz. 1 10
Gem, flat, No. 3....per doz. 1 00

VENTILATORS

Standard .....30 to 40%

WIRE

Plain annealed wire, No. 6 per 100 lbs. $3 05
Galvanized barb wire, per 100 lbs. 3 90
Wire Cloth—black painted, 12-mesh, per 100 sq. ft.... 1 85
Cattle Wire—galvanized catch weight spool, per 100 lbs.. 3 90
Galvanized Hog Wire, 80 rod spool, per spool 3 15
Galvanized Plain Wire, No. 9, per 100 lbs. 3 85
Stove Pipe, per stone..... 1 10

BUYERS' DIRECTORY

Asbestos Liquid.
B. & F. Mfg. Co., Des Moines, Ia.

Acetylene (Gas) Dissolved.
Prest-O-Lite Co., Inc., New York, N. Y.

Air Filters.
Sturtevant Co., B. F., Boston, Mass.

Bolts—Stove.
The Kirk-Latty Co., Cleveland, Ohio
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Brakes—Bending.
Dreis & Krump Mfg. Co., Chicago, Ill.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Brakes—Cornice.
Dreis & Krump Mfg. Co., Chicago, Ill.

Brass and Copper.
American Brass Co., Waterbury, Conn.
Copper & Brass Research Association, New York

Burners—Gas.
Wonder-Worker Gas Appliance Co., Cincinnati, Ohio

Cans—Garbage.
Osborn Co., The J. M. & L. A., Cleveland, Ohio

Castings—Malleable.
Fanner Mfg. Co., Cleveland, Ohio

Ceilings—Metal
Burton Co., The W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Wheeling Corrugating Co., Wheeling, W. Va.

Chaplets.
Fanner Mfg. Co., Cleveland, Ohio

Chimney Tops.
Standard Ventilator Co., Lewisburg, Pa.

Clinker Tongs.
L. J. Mueller Furnace Co., Milwaukee, Wis.
Stover Mfg. & Engine Co., Freeport, Ill.

Copper.
American Brass Co., Waterbury, Conn.
Copper & Brass Research Association, New York

Cornices.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Cutting Blowpipes.
Oxweld Acetylene Co., New York, N. Y.

Cut-offs—Rain Water.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Dampers—Quadrants—Accessories.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
L. J. Mueller Furnace Co., Milwaukee, Wis.
Parker-Kalon Corp., New York, N. Y.
Stover Mfg. & Engine Co., Freeport, Ill.

Damper Regulators.
National Regulator Co., Chicago, Ill.

Dies—Punch & Press.
La Salle Machine Works, Chicago, Ill.

Diffuser—Air Duct.
Aeolus-Dickinson Co., Chicago, Ill.
L. J. Mueller Furnace Co., Milwaukee, Wis.

Doors—Metal.
Lupton's Sons Co., David, Philadelphia, Pa.

Drive Screws—Hardened Metallic.
Parker-Kalon Corp., 200 Varick St., New York

Eaves Trough.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Berger Co., L. D., Philadelphia, Pa.
Burton Co., The W. J., Detroit, Mich.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
New Jersey Zinc Sales Co., The, New York, N. Y.
Wheeling Corrugating Co., Wheeling, W. Va.

Elbows and Shoes—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Wood Faces—Cold Air.
Auer Register Co., Cleveland, Ohio
American Wood Register Co., Plymouth, Ind.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Fences.
American Steel & Wire Co., Chicago, Ill.

Fittings—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Flanges.
Chicago Metal Mfg. Co., Chicago, Ill.

Fittings—Steel Pipe.
Chicago Metal Mfg. Co., Chicago, Ill.

Flue Thimbles.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Furnace Cement—Asbestos
Connors Paint Mfg. Co., Wm., Troy, N. Y.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Furnace Cement—Liquid.
Technical Products Co., Pittsburgh, Pa.

Furnace Cleaners—Suction.
Brillion Furnace Co., Brillion, Wis.
Sturtevant Co., B. F., Boston, Mass.

Furnace Coloring (Enamel).
B & F Mfg. Co., Des Moines, Iowa

Furnace Fans.
A. H. Robinson Co., Massillon, Ohio
Warm Air Furnace Fan Co., The, Cleveland, Ohio

Furnace Fuse.
National Regulator Co., Chicago, Ill.

Furnace Regulators.
National Regulator Co., Chicago, Ill.

Furnace Rings.
Forest City-Walworth Run Foundries Co., Cleveland, O.
Milwaukee Corrugating Co., Milwaukee, Wis.

Furnaces—Gas.
Mueller Furnace Co., L. J., Milwaukee, Wis.

Furnaces—Warm Air.
Agricola Furnace Co., Gadsden, Ala.
American Furnace Co., St. Louis, Mo.
Brillion Furnace Co., Brillion, Wis.
Floral City Heater Co., Monroe, Mich.
Forest City-Walworth Run Fdy. Cleveland, Ohio
Fox Furnace Co., Elyria, Ohio
Henry Furnace & Fdy. Co., Cleveland, Ohio
Hess-Snyder Co., Massillon, Ohio
Homer Furnace Co., Coldwater, Mich.
Langenberg Mfg. Co., St. Louis, Mo.
Lennox Furnace Co., Marshalltown, Ia.; Syracuse, N. Y.
May-Fiebeger Furnace Co., Newark, Ohio
Meyer Furnace Co., The, Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
Mt. Vernon Furnace & Mfg. Co., Mt. Vernon, Ill.
Mueller Furnace Co., L. J., Milwaukee, Wis.
Richardson & Boynton Co., New York, N. Y.
Robinson Co., A. H., Massillon, Ohio
Rybolt Heater Co., Ashland, Ohio
Standard Furnace & Supply Co., Omaha, Neb.
Success Heater Mfg. Co., Des Moines, Ia.
Thatcher Co., Chicago, Ill.
XXth Century Heating & Ventilating Co. Akron, Ohio
Waterman-Waterbury Co., Minneapolis, Minn.
Western Steel Products Co., Duluth, Minn.
Wise Furnace Co., Akron, Ohio

Gas (Acetylene) Dissolved
Prest-O-Lite Co., Inc., New York, N. Y.

Gas (Nitrogen).
Linde Air Products Co., New York, N. Y.

Gas (Oxygen).
Linde Air Products Co., New York, N. Y.

Glass—Wire.
Lupton's Sons Co., David, Philadelphia, Pa.

Grilles.
Auer Register Co., Cleveland, Ohio
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Co., New Britain, Conn.
Independent Reg. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Grilles—Store Front.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Guards—Machine and Belt.
Harrington & King Perforating Co., Chicago, Ill.

Handles—Boiler.
Berger Bros. Co., Philadelphia, Pa.

Handles—Soldering Iron.
Hyro Mfg. Co., New York, N. Y.

Hangers—Eaves Trough.
Berger Co., L. D., Philadelphia, Pa.
Horan Stay Hanger Co., Louisville, Ky.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Heat Regulation Systems.
National Regulator Co., Chicago, Ill.

Heaters—Cabinet.
Fox Furnace Co. Elyria, Ohio
Mueller Furnace Co., L. J., Milwaukee, Wis.
Waterman-Waterbury Co., Minneapolis, Minn.

Heaters—School Room.
Floral City Heater Co., Monroe, Mich.
Meyer Furnace Co., The, Peoria, Ill.
L. J. Mueller Furnace Co., Milwaukee, Wis.
Standard Furnace & Supply Co., Omaha, Neb.
Waterman-Waterbury Co., Minneapolis, Minn.

Hooks—Conductor.
Berger Co., L. D., Philadelphia, Pa.

Hotels.
Fort Shelby Hotel, Detroit, Mich.

Humidifiers
Automatic Humidifier Co., Cedar Falls, Iowa
L. J. Mueller Furnace Co., Milwaukee, Wis.

Lath—Expanding Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Machines—Crimping
Bertsch & Co., Cambridge City, Ind.

Machinery—Culvert.
Bertsch & Co., Cambridge City, Ind.

Machines—Tinsmith's.
Bertsch & Co., Cambridge City, Ind.
Burton Co., The W. J., Detroit, Mich.
Dreis & Krump Mfg. Co., Chicago, Ill.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.

Mandrels.
Hyro Mfg. Co., New York, N. Y.

Metals—Perforated.
Harrington & King Perforating Co., Chicago, Ill.

Miters.
Friedley-Voshardt Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Miters—Eaves Trough.
Barnes Metal Products Co., Chicago, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Nails—Hardened Masonry.
Parker-Kalon Corp., New York, N. Y.

Nails—Wire.
American Steel & Wire Co., Chicago, Ill.

Nitrogen (Gas)
Linde Air Products Co., New York, N. Y.

Oil Burners.
McIlvaine Burner Corp., Evanston, Ill.

Ornaments—Sheet Metal.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Oxygen (Gas).
Linde Air Products Co., New York, N. Y.

Paint.
Conners Paint Mfg. Co., Wm., Troy, N. Y.

Patterns—Furnace and Stove.
Cleveland Castings Pattern Co., Cleveland, Ohio
Quincy Pattern Co., Quincy, Ill.
Vedder Pattern Works, Troy, N. Y.

Pipe and Fittings—Furnace.
Burton Co., The W. J., Detroit, Mich.
Henry Furnace & Fdy Co., Cleveland, Ohio
Lamneck Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Mueller Furnace Co., L. J., Milwaukee, Wis.
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Standard Furnace & Supply Co., Omaha, Neb.

BUYERS' DIRECTORY

Pipe and Fittings—Stove.
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Pipe—Conductor.
Barnes Metal Products Co., Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Chicago Metal Mfg. Co., Chicago, Ill.
Dieckmann Co., Ferdinand, Cincinnati, Ohio
Friedley-Voshardt Co., Chicago, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
New Jersey Zinc Sales Co., The, New York, N. Y.
Wheeling Corrugating Co., Wheeling, W. Va.

Presses.
La Salle Machine Works, Chicago, Ill.

Punches.
Bertsch & Co., Cambridge City, Ind.
Interstate Machinery Co., Chicago, Ill.
La Salle Machine Works, Chicago, Ill.
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.

Punches—Combination Bench and Hand.
Hyro Mfg. Co., New York, N. Y.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Whitney Mfg. Co., W. A., Rockford, Ill.

Punches—Hand.
Hyro Mfg. Co., New York, N. Y.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Whitney Mfg. Co., W. A. Rockford, Ill.

Putty—Stove.
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Radiator Cabinets.
The Hart & Cooley Mfg. Co., New Britain, Conn.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Radiators—Shields.
Beh & Co., Inc., New York, N. Y.

Ranges—Combination Gas & Coal.
Quick Meal Stove Co., St. Louis, Mo.
Thatcher Co., Newark, N. J.

Ranges—Gas.
Quick Meal Stove Co., St. Louis, Mo.

Register Shields.
Beh & Co., Inc., New York, N. Y.

Registers—Warm Air.
Auer Register Co., Cleveland, Ohio
Forest City-Walworth Run Foundries Co., Cleveland, O.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Lamneck & Co., W. E., Columbus, Ohio
Meyer & Bro. Co., F., Peoria, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan City
Mueller Furnace Co., L. J., Milwaukee, Wis.
Stearns Register Co., Detroit, Mich.
Standard Furnace & Supply Co., Omaha, Neb.
Tuttle & Bailey Mfg. Co., Chicago, Ill.

Registers—Wood.
American Wood Register Co., Plymouth, Ind.
Auer Register Co., Cleveland, Ohio
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
L. J. Mueller Furnace Co., Milwaukee, Wis.

Repairs—Stove and Furnace.
Hessler Co., H. E., Syracuse, N. Y.

Ridging.
Armco Distributors Ass'n of America, Middletown, Ohio
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go La Crosse, Kan. City

Rivets—Stove.
The Kirk-Latty Co., Cleveland, Ohio
Lamson & Sessions Co., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Rods—Stove.
The Kirk-Latty Co., Cleveland, Ohio
Lamson & Sessions Co., Cleveland, Ohio

Rolls—Forming
Bertsch & Co., Cambridge City, Ind.

Roofing Cement
Connors Paint Mfg. Co., Wm., Troy, N. Y.

Roof—Flashing.
Hessler Co., H. E., Syracuse, N. Y.
Milwaukee Corrugating Co., Milwaukee, Wis.

Roofing—Iron and Steel
Armco Distributors Ass'n of America, Middletown, Ohio
Burton Co., The W. J., Detroit, Mich.
Friedley-Voshardt Co., Chicago, Ill.
Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing—Tin.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.

Roofing Tools.
Wm. Eiermann, Brooklyn, N. Y.

Roofing—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Rubbish Burners.
Hart & Cooley Co., New Britain, Conn.

Schools—Sheet Metal Pattern Drafting.
St. Louis Technical Institute, St. Louis, Mo.

Schools—Warm Air Heating.
St. Louis Technical Institute, St. Louis, Mo.

Screws—Hardened Metallic Drive.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screws—Hardened Self-Tapping, Sheet Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Parker-Kalon Corp., 200 Varick St., New York

Screens—Perforated Metal.
Harrington & King Perforating Co., Chicago, Ill.

Shears—Hand and Power.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Unishear Co., Inc., New York, N. Y.
Viking Shear Co., Erie, Pa.

Sheet Metal Screws—Hardened, Self-Tapping.
Parker-Kalon Corp., 200 Varick St., New York

Sheets—Black and Galvanized.
Armco Distributors Ass'n of America, Middletown, Ohio
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Inland Steel Co., Chicago, Ill.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Ryerson & Son, Inc., Jos. T. Chicago, Ill.
Taylor Co., N. & G., Philadelphia, Pa.
Wheeling Corrugating Co., Wheeling, W. Va.

Sheets—Iron.
Armco Distributors Ass'n of America, Middletown, Ohio
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Sheets—Tin.
Taylor Co., N. & G., Philadelphia, Pa.

Sheets—Zinc.
New Jersey Zinc Sales Co., The, New York, N. Y.

Shingles and Tiles—Metal.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Wheeling Corrugating Co., Wheeling, W. Va.

Sifters—Ash.
Diener Mfg. Co., G. W., Chicago, Ill.

Sky Lights.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Snips.
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Solder.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Soldering Furnaces.
Burgess Soldering Furnace Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Quick Meal Stove Co., St. Louis, Mo.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Specialties—Hardware.
Diener Mfg. Co., G. W., Chicago, Ill.
Hessler Co., H. E., Syracuse, N. Y.

Stars—Hard Iron Cleaning.
Fanner Mfg. Co., Cleveland, Ohio

Statuary.
Friedley-Voshardt Co., Chicago, Ill.
Gerock Bros. Mfg. Co., St. Louis, Mo.

Steel Pipe—Welded.
Chicago Metal Mfg. Co., Chicago, Ill.

Stove Pipe Reducers.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City

Stoves—Camp.
Quick Meal Stove Co., St. Louis, Mo.

Stoves—Gasoline and Oil.
Quick Meal Stove Co., St. Louis, Mo.

Stoves and Ranges.
Quick Meal Stove Co., St. Louis, Mo.
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Osborn Co., The J. M. & L. A., Cleveland, Ohio
Taylor Co., N. & G., Philadelphia, Pa.

Tools—Roofers.
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Tools—Tinsmith's.
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Hyro Mfg. Co., New York, N. Y.
Interstate Machinery Co., Chicago, Ill.
Marshalltown Mfg. Co., Marshalltown, Iowa
Osborn Co., The J. M. & L. A., Cleveland, Ohio
Peck, Stow & Wilcox Co., Southington, Conn.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.

Torches.
Burgess Soldering Furnace Co., Columbus, Ohio
Diener Mfg. Co., G. W., Chicago, Ill.
Quick Meal Stove Co., St. Louis, Mo.
Ryerson & Son, Inc., Jos. T., Chicago, Ill.

Trade Extension.
Copper & Brass Research Association, New York, N. Y.
Sheet Steel Trade Extension Committee. Pittsburgh, Pa.

Trimmings—Stove.
Fanner Mfg. Co., Cleveland, Ohio

Ventilators
Aeolus Dickinson Co., Chicago, Ill.
Akrat Ventilators, Inc., Chicago, Ill.
Arex Company, Chicago, Ill.
Berger Bros. Co., Philadelphia, Pa.
Friedley-Voshardt Co., Chicago, Ill.
Kornchen Co., Chicago, Ill.
Lupton's Sons Co., David, Philadelphia, Pa.
Milwaukee Corrugating Co., Mil., Ch'go, La Crosse, Kan. City
Standard Ventilator Co., Lewisburg, Pa.

Ventilators—Ceiling.
Hart & Cooley Co., New Britain, Conn.
Henry Furnace & Fdy. Co., Cleveland, Ohio
Tuttle & Bailey Mfg. Co., New York

Windows—Steel.
Lupton's Sons Co., David, Philadelphia, Pa.

Zinc.
New Jersey Zinc Co., The, New York, N. Y.

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Yearly subscribers to the AMERICAN ARTISAN may insert advertisements of not more than fifty words in our Want and Sales Columns WITHOUT CHARGE.

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For Sale—A real, honest-to-goodness sheet metal shop and warm air heating business in a town of 6,000 that's booming; a wonderful opportunity for a live wire. Stock at invoice, tools at half invoice price. Will take about $3,200 to handle this. Address D-480, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago.

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For Sale — Old established tin and plumbing shop. Another plumbing shop in town. No tin shop. Big possibilities in barn ventilation. Big dairy country, population 1,500. Good territory to draw from. For further information write L480, AMERICAN ARTISAN, 620 So. Michigan Avenue, Chicago, Ill.

For Sale—Roofing, heating and sheet metal business at 1684 Dorr street, Toledo, Ohio. Established over 18 years. Am in manufacturing business which requires all my time. For further information address A. W. Bishop, 1684 Dorr street, Toledo, Ohio. G-480

Wanted—Partner, preferably located in East. I have moderate capital to invest in an established furnace business; 25 years' successful experience. Address Garver-Homer Furnace Company, Coldwater, Michigan. C-480

For Sale—A good sheet metal business at less than price of second hand tools. I am leaving city on account of other interests. Address J. F. Arnold, 27 Riverside Drive, Huntington, Indiana. K480

For Sale—Well established sheet metal shop. Must sell on account of ill health. Address Fred Steinwax, DuQuoin, Ill. E-480

BUSINESS CHANCES

For Sale—Warm Air Heating and Sheet Metal Business in city of 30,000 population. Good farming and dairy country. Address Y-480, AMERICAN ARTISAN, 620 So. Michigan Avenue, Chicago, Illinois.

SITUATION WANTED

Situation Wanted as superintendent or foreman in a production or sheet metal shop. Have worked 10 years in a shop where they make everything that is possible out of sheet metal. Know safety rules and how to make machine guards. At liberty August 1st. State proposition in first letter. Address C. O Owen, % R. C. Wade, Arlington and Joy Avenue, Akron, Ohio. H-479

Situation Wanted by all around first class sheet metal worker, layout man and foreman. Fully experienced in all classes of work including skylight, cornice, ventilation, blow pipes, etc. 28 years of experience. Married, sober, steady and a hard worker. Will go anywhere. State pay and particulars. Address Sheet Metal Worker, 6416 23rd Ave., Kenosha, Wis. K-479

Steady position wanted with reliable concern by sheet metal worker and furnace man. Can read blue prints and knows the Standard Code. Good sheet metal draftsman. Married, sober and reliable; 37 years of age. Have steady employment but have best reasons for changing. Wisconsin preferred. Address W-479, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago, Ill.

SITUATION WANTED

First Class Sheet Metal Worker wants position. 18 years in all branches of the trade including heating, school house ventilation, blow pipe, etc. Four years in charge of shop for concern in Montana. Single. Will go anywhere but prefer the Pacific Coast. Address W480, AMERICAN ARTISAN, 620 S. Michigan Avenue, Chicago.

Situation wanted by first class sheet metal worker. Can do some plumbing also pumps and windmills. 22 years' experience. Prefer Illinois. Can give good reference. Address J-479 AMERICAN ARTISAN, 620 S. Michigan Ave., Chicago, Ill.

Position Wanted — By sheet metal worker. Married, 30 years of age. Can draft patterns, do roofing, blowpiping, ventilating and copper work. Please state wages in first letter. Address X480, AMERICAN ARTISAN, 620 S. Michigan, Chicago, Ill.

For Sale—A portion of my brain power to be used in a tin shop by a sure enough tinner and furnace man. I am selling this material on guilt-edge guarantee. For quick action wire H. S. Glenn, Mountain Grove, Missouri. Z-480

HELP WANTED

Wanted—Combination man. An intelligent, forceful, heating, plumbing and tinning man who knows his business and can supervise correct installation of the above. We have an unusual year around position for a business builder who can cut down on overhead and who will work heart and soul with his employer. Address Butters-Fetting Company, 461 11th avenue, Milwaukee, Wisconsin. A-480

Wanted—High class furnace salesman; must be well educated and experienced in all branches of the business; must also have knowledge of old and new house work. Permanent position with old established St. Louis firm for party who qualifies. Give references in first letter. Salary no object. Address Z-479, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago.

Wanted — All-around mechanic with good personality, experienced in sheet metal, plumbing, furnace, pump and windmill work. Steady position, salary and bonus to satisfactory man. Desirable town in Northern Illinois. Address Cullison Hardware, Hebron, Ill. O480

Wanted—Window display man, card and newspaper ad writer. Good salary for the right man. Address P480, AMERICAN ARTISAN, 620 S. Michigan Avenue, Chicago, Ill.

Wanted—First class sheet metal worker and furnace man. Steady work for a good man. Union Shop. Address R480, AMERICAN ARTISAN, 620 S. Michigan Avenue, Chicago, Illinois.

Wanted at Once—First class sheet metal worker and furnace man, only first class mechanic need apply. Address Shank Roofing and Metal Works, Scottsbluff, Nebraska. Y-479

Wanted at Once—Sheet metal worker and furnace installer. Only capable man need apply. State wages expected when replying. Address Hurdle Hardware, Rock Falls, Illinois. A-481

Wanted—Furnace salesman; must be A-1, understand Code and estimate and figure installation. Address X-479, AMERICAN ARTISAN, 620 S Michigan avenue, Chicago.

Wanted—First class sheet metal worker and furnace man. None but A-1 mechanic need apply. Address Jno. F. Cartwright, Bowling Green, Ky. M480

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For Sale—Tools and truck, also lot, 30x 35, and building, 28x38, located on state highway and road connections to richest farming community in state, on edge of Kansas City. Address H-480, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago.

For Sale—Ideal boiler—steam, No. 085, also 285 feet three column 38-inch steam radiation; cheap if taken at once. Address J-480, AMERICAN ARTISAN, 620 S. Michigan avenue, Chicago.

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For Sale—1 8-ft. cast iron Robinson Brake, 1 pair 30-in. Square Shears. First check for $100.00 takes both f. o. b. Muskegon. Address The Alamo Furnace Company, 541 West Western Avenue, Muskegon, Michigan. C-481

For Sale—Set of Tinners' Tools, all in good condition. A bargain if taken at once. Address Manrow Sheet Metal Company, 1328 So. Main Street, Elkhart, Indiana. B-481

Wanted—Used 8-foot brake in good condition. State price and make in first letter. Address J. S. Nelson, 221 West 9th street, Sioux Falls, S. Dakota. B-480

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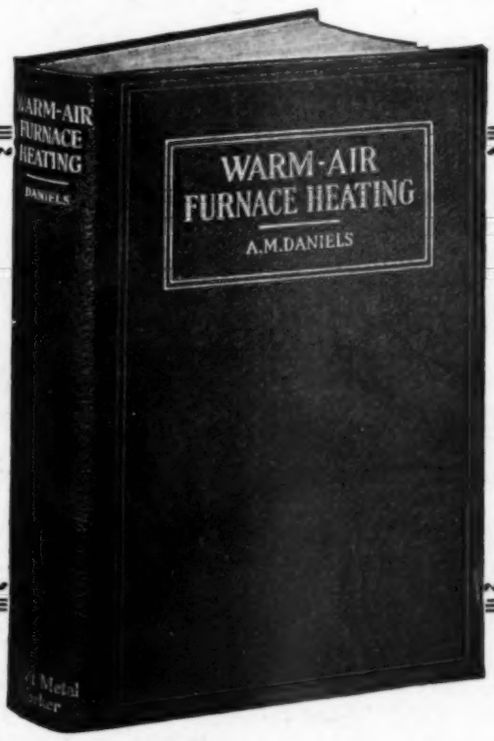
6. Effect of Register-Air Temperature, Leader Area and Size of Wall Stack Upon Heating Effect Produced.
7. Insulating Coverings and Their Effect Upon Leader and Wall Stack Operation.
8. Casing Diameter vs. Furnace Capacity.
9. Air Supply to Furnace.
10. Furnace Capacity and Rating.



CHAPTER HEADINGS

11. Register Grilles vs. Plant Capacity.
12. Chimneys and Flues.
13. Humidity.
14. Evaporating Pans.
15. Combination Heating Systems —Warm Air and Hot Water.
16. Gas Warm-Air Heating.
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